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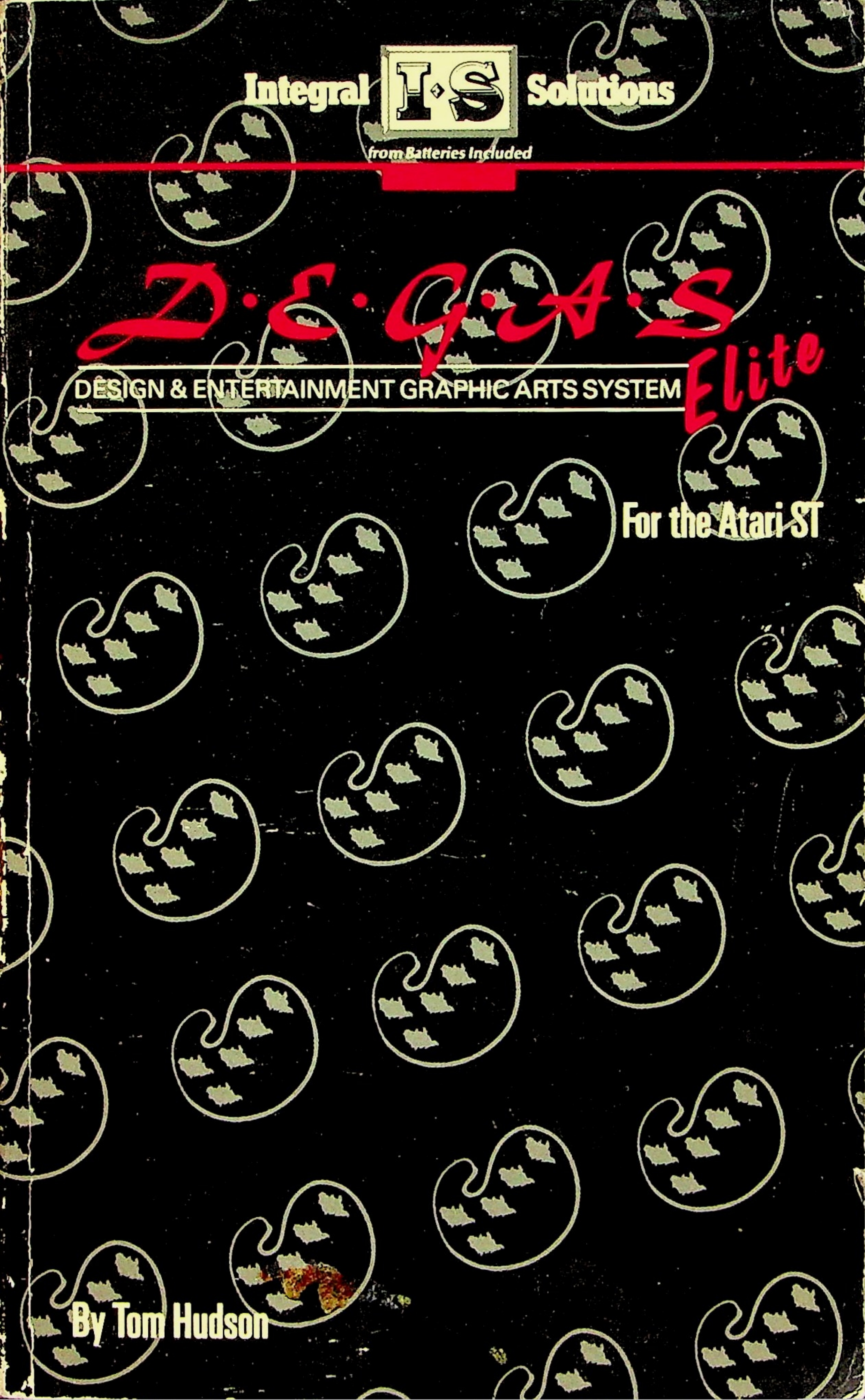

D·E·G·A·S Elite

DESIGN & ENTERTAINMENT GRAPHIC ARTS SYSTEM

For the Atari ST

By Tom Hudson

D·E·G·A·S Elite

DESIGN & ENTERTAINMENT GRAPHIC ARTS SYSTEM

for the Atari ST

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We've tried to make this manual as complete as possible but in the event of updates, enhancements, or last minute changes, you may find enclosed one or more loose sheets or a Read.Me file containing updates completed after this manual went to press. Please be sure that you note any comments or corrections they may contain.

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Michael H. Reichmann
President
Batteries Included
September 1986

FOREWORD

By Tom Hudson

If there's one thing that characterizes the world of computers (and personal computers in particular), it's change. Everything changes so quickly in the personal computer world that it's almost scary.

When the original DEGAS was created, the Atari ST was still in its infancy. The operating system took a huge chunk of available memory, there were very few programs available and information on the machine's innards was scarce.

Ten months later, the ST had come of age. There are now memory expansions (and, of course, the 1040ST) that give your personal computer more memory than many mainframes had just a few years ago. The TOS operating system has been placed where it belongs, in Read-Only Memory chips, freeing up memory for other uses. Many programs are now available. There are high-speed, large-capacity hard disk drives. There are new books practically every week in national book stores.

What all this means is that we can now take advantage of the new features offered by the ST systems in DEGAS Elite, giving you multiple workscreens, the ability to cut-and-paste between screens, rotate, stretch and distort portions of the screen, and much more — things we couldn't do in the "early days".

I'm excited by DEGAS Elite, possibly more than I was by the original DEGAS. Seeing the artwork that you created with DEGAS always made my day, and I can't wait to see what the ST's creative users do with the additional power offered by DEGAS Elite.

This program's for you — start creating!

D.E.G.A.S. Elite is dedicated to my parents, James and Marian Hudson, who have always given me their support and encouragement.

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INTRODUCTION

DEGAS Elite is a sophisticated graphics and drawing program written by Tom Hudson for the Atari ST. It works in and supports all three resolution modes, so no matter which monitor you have, you can use DEGAS to produce art and graphics. You can save your picture to disk or print it on your printer. You can even load pictures created in a different resolution from the one you're using. DEGAS works with one or two floppy disk drives, RAMdisks and hard disk drives.

DEGAS stands for "**D**esign and **E**ntertainment **G**raphic **A**rts **S**ystem". DEGAS Elite is the second generation of the original DEGAS program. We have added many enhancements, new features and new capabilities to the original concept, and the program now uses the power of the Atari ST computer much more than ever before. It has significantly changed since the first version, so we recommend that you read this manual through first, before using the program. Users familiar with the first edition of DEGAS will find many of the basic drawing techniques and mechanics are much the same. However, many features such as block manipulation, stipple, multiple workscreens and the different levels of magnification are new to the Elite version.

Before you use DEGAS Elite, you should read your ST manual to become familiar with using the menus, loading programs, making copies, the disk and other features of the machine.

GETTING STARTED

ABOUT THIS MANUAL

Every attempt has been made to provide you with a complete, comprehensive manual. However, things sometimes change as a program is developed or users often find something hidden within the program, tips, techniques or problems. **In this case, we will put a file called READ.ME on the master disk.** You should print or display this file first, before you read the rest of this manual.

DEGAS is not a difficult program to use, but because of its many features, we have organized the manual to fit an easy learning curve. We begin with the basic tools and work up to the more advanced features. If you're already familiar with the original DEGAS, you'll recognize a lot of the initial material here. There is quite a considerable amount of new material added, so you should at least browse through the manual to familiarize yourself with the differences between the early DEGAS and DEGAS Elite. A reference guide is provided at the back, which covers a lot of the new features. It is, however, not meant as a substitute for this manual.

BACKUPS

Batteries Included and the author both believe that you — the buyer of this program — should be able to make backup copies FOR YOU OWN USE. DEGAS Elite is not protected, so before you use it, you should make a backup copy of the program on a blank, formatted disk. Making copies and formatting disks are explained in your ST manuals. If you're not familiar with Atari ST disks and folders, read the appendix on disks in this manual. It will tell you what files need to be on what disks.

Because you can backup the program, we expect you to respect the copyright and not give away, sell or even lend copies of this program to others. You, the buyer, are the ONLY authorized user of this program. The author spent many hours designing, developing and writing this program. His income depends on sales of this program; pirate copies hurt him - he's an individual just like you who works for his living. Many other people worked very hard to make sure this program works properly, to test it and to write the manual. Pirate copies also make their efforts less valuable. It discourages everyone's further efforts in this field. Please don't make or accept a pirate copy of this program. Piracy is theft, just like shoplifting or burglary and just as illegal.

If you are reading a photocopy of this manual, you probably didn't buy the original program. We ask that you please destroy the copy immediately and erase the unauthorized copies on your disk(s). A legitimate copy may be purchased from a local dealer, mail order house or directly from BATTERIES INCLUDED at 1-800-387-5707

LOADING DEGAS ELITE

This manual assumes you have TOS in ROM. If you are still loading TOS from disk, we suggest you have your system upgraded to a ROM version. With TOS on disk, you do not have sufficient memory to use this program efficiently. DEGAS Elite will not work in a 520 ST unless it is equipped with TOS in ROM.

First, turn on your Atari disk drive(s), monitor, and then place the DEGAS Elite disk in drive A: (this disk should have the DEGELITE.PRG and DEGELITE.RSC files, ASSIGN.SYS and the AUTO folder with GDOS.PRG in it as well as all of your font files). Place a formatted work disk for saving pictures in the second drive (B:). Now turn on your ST.

Hard disk users can run DEGAS from any drive or within a folder on any drive, and save to any drive or folder. But ASSIGN.SYS, any font files and the AUTO folder with GDOS.PRG must be on the disk in drive A:.

If you have a **monochrome monitor**, you can simply run DEGAS Elite as is. However, if you have a **color monitor**, you should first select your desired resolution mode through the 'set preferences' choice in the desktop 'OPTIONS' menu BEFORE you load DEGAS Elite. You can't switch resolution modes once you're running the program. Low resolution has 320 by 200 pixels with a choice of 16 colors, medium has 320 by 400 and four colors. High resolution is 640 by 400, black and white and only obtainable by a monochrome monitor. Note that you CAN load pictures between resolutions, as explained in the section on files.

If you only have a one drive system, when loading the program or pictures, your ST will ask you to insert your A and B disks into that drive.

When the screen display shows you the contents of the disks (you may have to "open" a floppy disk to see the display by double clicking on the disk icon, explained in your ST manual), move the cursor (the figure on the screen you move with your mouse - usually an arrow but it can also be a brush shape while drawing, an hourglass or a bee) to the icon named "DEGELTITE.PRG" and press the mouse left button twice in rapid succession. You can also use the "open" command from the file menu to load DEGAS Elite.

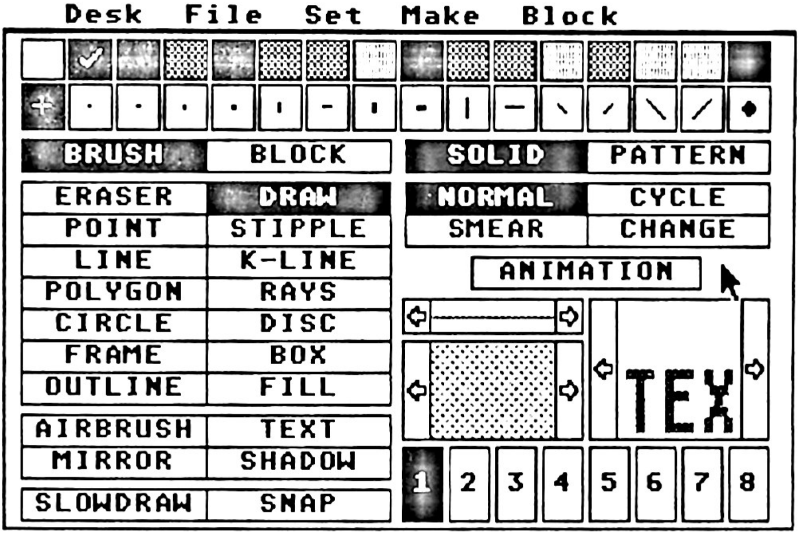
Since DEGAS Elite offers up to eight workscreens in memory at once, it uses a lot of memory. You can restrict the number of workscreens, thereby retaining more memory for large text font files or desk accessories by holding down the ALT key before you load DEGAS Elite and keeping it held until the message about workscreens appears on the screen. You can have as few as two workscreens or as many as eight if you have one megabyte of RAM to work in.

Note: Fonts listed in ASSIGN.SYS are automatically loaded into memory when you load DEGAS Elite; see pag. 56.

Important Note: Due to limitations of available memory in the Atari 520 ST, you normally only have two workscreens. You can increase the number of screens to three by not booting with GDOS in the AUTO folder (see pages 56 and 66). This has the drawback of not permitting any but the system font to be used as text. On a 1040 ST, you can have up to eight workscreens, plus full font capability.

THE BASICS

THE MENU SCREEN



Take a look at the main menu screen. Across the top you'll see the pull-down menu bar with the selections 'Desk', 'File', 'Set', 'Make' and 'Block'. Below that is the color palette: the available colors for your current resolution - 16 in low res mode, 4 in medium res and two - black and white - in high res mode. Below the color boxes are the brush and pen shapes. On the left are the graphic feature command boxes and to the right the current fill pattern, text and line pattern. The numbered boxes at the bottom right indicate which workscreen is currently in use.

When you move your cursor into a feature box and press the left mouse button, the box is highlighted, indicating you have chosen that feature. Double-clicking a box usually brings up a dialog box in which you determine aspects or parameters of that feature. When you select a color, the fill (if a mono fill, explained below), text and line pattern change to that color.

Brush and color selection are essential to your drawing. Whatever you draw in DEGAS Elite, you use the color and brush shape you select in the menu screen. Many features also use the line and fill patterns. Some require you to press and hold the left mouse button, others to press the left mouse button and release it. Most of the time, the UNDO key erases the last thing you've drawn, copied, moved or written, but only if you haven't left the drawing screen or started another function. Other keys are used for effects not listed on the menu screen and as keyboard command substitutes for menu selections. Features that aren't available or appropriate to a menu selection are greyed out and not accessible. This is all described in detail below.

KEYS AND KEYSTROKES

Several features are toggled, initiated or stopped by pressing different keys in either the menu or the drawing screens. Almost every option in the main menu can be activated in a drawing screen by a single keystroke. The arrow keys also work to cycle through brush and color choices in the drawing screens. These are all explained in the appropriate sections and in the reference guide at the end of this manual.

The most important key to remember is UNDO. This cancels almost every last action in a drawing screen and restores your picture to its original state before you began that action.

Note: if you want to use UNDO, do it IMMEDIATELY; any other action or mouse button press will prevent UNDO from fixing your work.

SCREENS AND MOUSE CONTROL

When you load the program, the first screen you see is the menu screen. It has the display of commands, colors, fill patterns, fonts, lines, brush shapes and other features DEGAS Elite offers, as well as the menu bar with additional items. The current drawing screen is the inverted, numbered box at the bottom right. To get the drawing screen, simply press the right mouse button; to get back to the menu, press it again. To select another screen to use, move the cursor to that number and click the left button.

The mouse is used to control almost all drawing features. Many keys also provide command controls. To select a feature from the menu screen, you simply position the cursor over it and press the left mouse button. With many of the menu items, (not the pull-down menus) to change that feature or enter the feature's dialog, double-click on the box. For example, to select the type of text, double click on the text box. To select the font or typeface, double click on the box displaying the current font, to the right of the menu screen. The feature's dialog box can also be entered by pressing the ALT key while clicking the left mouse button over the control box.

In the drawing screen, the left mouse button 'anchors' the cursor once you have positioned it and activates the feature chosen previously — for example, the left mouse button sets the start of a line. In many cases, the right button cancels the feature before it is made permanent (as does the UNDO key). Pressing the left mouse button after something has been drawn accepts it as part of the picture (but UNDO still cancels it).

DEGAS now supports multiple drawing or workscreens, depending on your memory configuration. A 520ST will support two simultaneous screens, a 1040 will support up to eight. To select a screen to work in, click on on the numbered box at the bottom right of the menu screen (or press a number on the keyboard). When you press the right mouse button, you enter that chosen workscreen. You can move to any workscreen from any other by simply pressing the appropriate numerical key. You don't have to go through the main menu screen first.

If you press the HELP key while in the main menu, you'll see a window which lists the names of all your screens (initially, of course, the lines are all empty). You can enter a name (click the cursor on the line and start typing) or delete a name (click the cursor on the name line and press ESC) or simply change it (click on the line and use Backspace and Delete). Names are not necessary, but they are convenient to help you remember which screens are which. If the screens are all loaded from different files, then you might want to enter the filenames here.

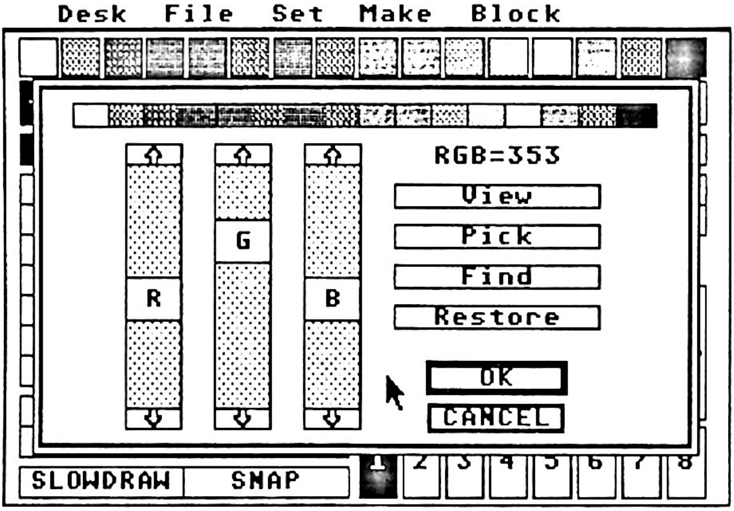
You can copy blocks from one screen and paste them into another. You can load and save pictures into each screen, but there are limitations. The first workscreen, number one, determines what color palette will be used by ALL screens. You can only have one palette for all available screens. This means that a picture loaded into workscreens two to eight which does not share the same color palette as that in workscreen one will look different from when it was saved or created.

A picture loaded into a workscreen other than number one therefore doesn't come with its own color palette; it must use the main palette shown in the menu screen. This type of picture when loaded from disk is called an image, in the file menu. You can load an image into any of the workscreens. DEGAS Elite first asks if you want to try to color the picture using the current palette. This routine attempts to match the colors on the existing palette to those in the image's palette.

You can also simply load a color palette from a picture file, using that menu option. This replaces the color palette currently in use. A picture in any workscreen is always saved with the current palette.

You can copy an entire screen to another screen from the main menu. Simply click on a workscreen and hold down the left mouse button. Now drag the cursor to the number of the screen where you want the first picture copied to. You'll be asked to confirm the copy. The entire picture will be duplicated in the destination workscreen almost instantly.

COLORS



In low-resolution, you have 16 colors, in medium-res, only four. The current color you're working in is shown in the palette and the fill, text and line boxes. Colors may be changed by double clicking on a palette box, then sliding the boxes on the "red-green-blue" level bars until you reach the desired shade, then click OK to make the change. You can change other colors within the dialog box by double-clicking on the 'mini-palette' at the top of the window.

Each bar has eight divisions to indicate the relative amount of that color to be added to the selected palette box. The top of each bar represents 100%, the bottom, zero. Move the cursor to the intended division in the bar and press the left mouse button. The small box identifying the level jumps to the new division. Or you can use the arrows at the ends of each bar to move the box one division in that direction.

With 100% of each color, you get white; with zero percent, you get black. The color numbers are read out beside the palette where it says 'RGB='. The values range from zero to seven, so a color number might be '136'. White is always '777' and black is '000'; pure red is '700', green is '070' and blue is '007'. Greys can be '444', '555' or '666'.

DEGAS won't let you change the rightmost color box to the same color as the background (the leftmost box). This is to prevent you from losing sight of the cursor and text and boxes in the menu screen. The background and rightmost colors must differ by at least a small amount so you don't get 'lost'.

You can copy a color from one position in the palette color dialog to another by pointing the mouse to the color you want to copy, pressing and holding the left mouse button, and "dragging" the color to the palette location where you want to place the color. Remember that if the color you are copying the first color to is used in any of the workscreens, it will be changed on the pictures.

If you want to define a range of colors from say, red to blue, all you have to do is define these two anywhere on your palette with one or more color boxes in between. Select one of these colors by double-clicking the left mouse button on it (a check mark will appear in the color's box), then hold down the ALT key and click the left mouse on the other color. DEGAS Elite calculates the colors between the two you originally defined and generates the intermediate shades automatically. This makes it much easier to generate a smooth color transition.

There are other options available in the set color dialog: **view**, **pick**, **find** and **restore**. **View** lets you see the effect of the change on your picture in the current workscreen; click here and hold down the left mouse button. When you release it, you return to the dialog box.

Pick displays all 512 colors of your ST's possible color range (unless, you have a monochrome monitor, of course). To select a color from the display, click the left mouse button on it and it will appear in a long bar, to the right of the display. Then, when you're satisfied with the color, click anywhere in that long bar to accept it. You'll return to the dialog box with that color now chosen.

Find takes you to the current workscreen. Here you use the cursor to select a color already in use in a picture. Press the left mouse button and that color is chosen for the current one in the dialog box. This is particularly useful if you want to edit a specific color or if you want to make another color only slightly different in shade. Examine the color; remember the RGB number if you're going to try to change another color to complement this one.

Restore changes the palette to the original default colors when you loaded the program. This is not the colors you load from a picture file; this is the Elite default palette. If you want to exit without making changes to the palette, don't click on restore; click on cancel.

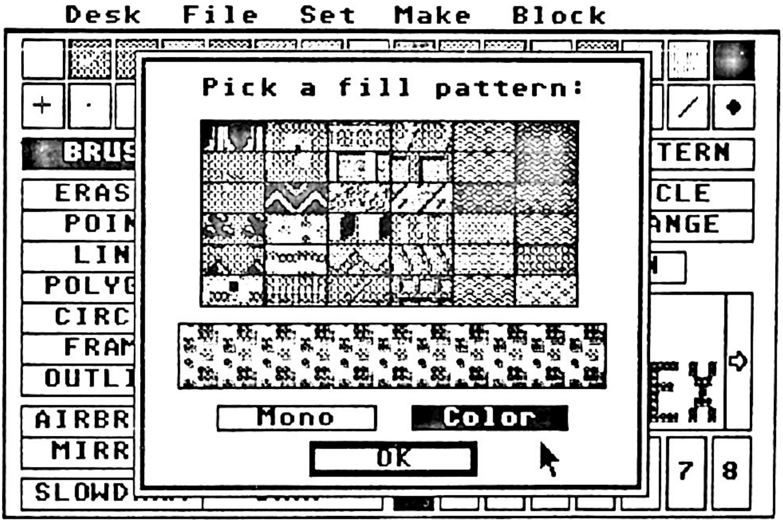
In high-res or monochrome mode, you have only two 'colors': black and white: there are no variations or shades of grey (you get these through different density fill patterns). When you draw or build a shape in monochrome, you must do so in the color opposite the background or the image won't show. You can select the color to draw in by positioning the cursor over the color palette box and pressing the left mouse button. Doing this also inverts the colors in the fill, text and line boxes and outlines the color chosen.

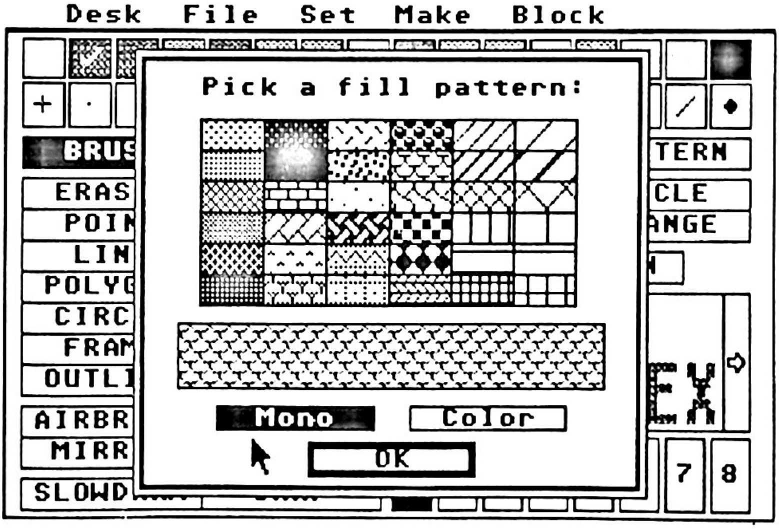
In monochrome, double-clicking on a color box reverses the color selection to the other. Also note that several features such as color cycle and animation work differently or not at all in monochrome than in any color mode.

The background color in any resolution is always the leftmost box on the color palette; the menu screen text and color fill pattern outline color is always the rightmost box. All other boxes are foreground colors. The color palette is always saved with every picture and block. The palette is replaced by the palette of any picture you load into workscreen one (or if you simply load a new color palette, described below). Pictures always load into workscreen one with their palettes. Images load into any workscreen and don't bring their color palettes with them (they use the current palette instead).

In a drawing screen (or workscreen), the up and down arrows shift to the next color up (right) or down (left) on the color palette without having to leave and go to the main menu screen to select one.

FILL PATTERNS





Fill patterns are not restricted to the fill feature. They can be used with other features such as draw, brush, eraser, lines, geometric shapes, stipple and airbrush.

To choose a fill pattern, position the cursor in the fill box and double-click the left mouse button. Then select the pattern from the display and click on OK. You can also click on the arrow keys left and right of the pattern box to cycle to the next fill pattern. Keep pressing until you find a pattern you want.

With a color monitor, you have two types of fill patterns; monoplane (mono-, or one-color) and colored (multicolor). The selection between these types is made by clicking on the appropriate box in the dialog window. With a monochrome monitor, there are only mono fill patterns.

Color fills paint over everything below them; mono fills can be set to paint over the picture or let it show through the background color. Color fills can support all the colors in your palette at once. Color fills always paint over the background in brush and eraser modes. However, if change is selected, they only change the specified color to that fill pattern.

Mono fills only use the current palette choice and the background (the leftmost color on the palette). If the background is the current color choice, the other mono fill color becomes the rightmost color. You can use mono fills with the eraser, brush, and change. Make sure 'pattern' is selected when drawing, because if solid is selected, you get the solid color chosen on the palette, rather than the fill pattern. In the actual 'fill' feature, solid and pattern have a different meaning, explained below.

In the chapter on pull-down menus, in the Make Fill section, you'll learn how to create your own fill pattern, replacing any pattern - of the 36 color or 36 mono available - with one of your own design. DEGAS has 36 of its own pre-designed fill patterns in each mode for you to work with. You can save your own designs to disk and load them in at any time over an existing pattern. Mono fill patterns are saved with a .FIL extension and can be loaded into any other resolution. Color fill patterns are saved as either .FI1 or .FI2 (low and medium resolutions, respectively) and can only be loaded into the proper resolution.

LEAVING DEGAS ELITE

The last selection in the pull-down file menu is 'quit'. That's the only proper way to leave DEGAS Elite to get back to the desktop. When you quit, the program asks you to confirm it by pressing the mouse button in the box. Never quit by simply turning the computer off.

THE DRAWING FEATURES

BRUSH AND BLOCK MODES

Keystroke: B

DEGAS Elite has two basic drawing tools: the **Brush** and the **Block**. In brush mode, the cursor in the drawing screen is always the current brush shape. You select one of the 15 default brush shapes by positioning the cursor over the desired shape and pressing the left mouse button. Every brush shape except the crosshair can be redesigned into your own shape by double-clicking on the brush box. When you select a brush shape, the brush box colors are inverted to highlight your choice.

The block is a new type of drawing tool, not used in the earlier DEGAS program. It permits you to define any part of your screen as a block - exactly as you would to move or copy a section, of any size - and draw, create geometric forms or erase with that portion just as you would a brush. Several features don't work with block or work somewhat differently than they do with brush, as described below.

A block can be any rectangle from a single pixel to an entire picture. To define a block, go to a workscreen where you have created or loaded a picture (or image). Now press ESC. This brings up the crosshair lines for alignment. Place the intersection of the lines at the upper LEFT of where you want your block to begin. Now press and hold the left mouse button and drag it to the lower right corner of your block. When you release the button, that section becomes your block. If you don't see anything appear, press the 'b' key to toggle block mode. This newly defined block acts exactly as a brush in most cases.

There are two parameters when using a block, set when you double-click on the block option in the menu screen. As 'x-ray', the background (leftmost) color is transparent and lets the picture below show through. As blocked, it paints over anything below with the entire block. Also, you can define the boundaries in which your block operates: if you don't want its edges to go beyond the edges of the screen, choose 'edge stop'. The other selection - free move - lets the block edge escape (disappear) off the visible screen.

A block always stays available for use until you define a new block, in which case it is erased. It can be hidden by toggling brush mode and recalled again by toggling back to block. It can be copied to any workscreen by pressing the left mouse button once, or used as a brush by holding down the button and 'painting' with it. Blocks can be manipulated in special ways, described in their own section below.

You can select either brush or block in the menu screen or pressing the 'b' key when in drawing mode. Your choice changes the type of cursor you use. Many of the drawing features (such as geometric figures) work in either mode. Others (outline, shadow, mirrors) work only in brush mode. The reference guide shows which are available in either mode.

The drawing modes are used for free-hand sketching and irregularly shaped lines. Drawing is done with either a brush or a block cursor, in solid or pattern mode. There is also the option of normal, smear, color cycle or change. For our basic drawing lesson right now, use normal. The others will be explained below.

Select the brush box, to be able to 'paint' on the screen using one of the brush cursors. You can either use it to draw continually by holding down the left mouse button, or as a single 'point' by pressing the button once (the point command selection only allows you to draw a single point at a time). In any draw mode, the shape of the cursor is that of the brush shape shown on the line below the color palette. The leftmost shape - the crosshair - produces a line one point wide and high; it's easier to align your images with it than some of the other shapes.

Choose a brush shape from the sixteen available; your lines and figures will be drawn with the shape and thickness of the brush you select. Creating a brush shape is done by selecting a brush to edit, then selecting 'Make brush' from the make pull-down menu. Every brush except the crosshair can be changed. This is described in detail in the section on pull-down menus.

Choose a color to draw in by clicking the mouse when the cursor is over the correct color box at the top of the menu screen. If you choose the same color as the background, you won't be able to see your drawing. Changing the color palette is described above.

You can toggle your brush shape up and down the available choices in a drawing screen by using the right and left arrow keys. These move you one brush shape selection in that direction and automatically switch you into draw mode.

DRAWING OPTIONS

These menu features all use either the brush or block. Many of these features can work in tandem with other features such as mirror and shadow, as explained later. Features that don't work with another are 'greyed-out' in the menu screen. There are often dialog boxes associated with these features that allow you to customize them to suit your needs. These boxes can be called by either double-clicking on the command box or pulling down the 'Set' menu and selecting the appropriate choice. Note that the cursor is also the current color while drawing.

Draw

Keystroke: D

This is the basic drawing mode using the mouse to direct your cursor. Press the right mouse button to enter the drawing screen. Use the mouse to position the cursor and hold down the left mouse button. Your drawing will start at that point. Keep the mouse button held down and move the mouse; the line you draw follows the cursor.

If you want a different line width, return to the menu screen and select another brush shape (not line; that's used by the geometric shapes and the line features) by clicking the left mouse button once when the cursor is in the desired brush box. You can also select another brush shape by pressing the right and left arrow keys rather than exiting to the main menu.

You can undo the last line drawn if you make a mistake. The UNDO key erases the line drawn from the last left mouse button press. If you draw several lines, it will only erase the last and only if you don't press either mouse button again before you press UNDO.

Drawing with a block is somewhat different. The edges of the block determine the colors that are drawn.

Point

Keystroke: P

Point works the same as draw except that each press of the left mouse button leaves a single point on the drawing screen the same size, brush shape and color of the cursor (or block if toggled). Point isn't used to draw a line, just single images of the brush shape or block. You can populate the screen with images of your custom brush shape - say a small figure like you'll find in the brush file 'MAN.BRU'.

Use UNDO to erase the last point drawn.

Eraser

Keystroke: E

There are several ways to erase a small section of the picture; one method is to draw over the area you want to delete with the background color. This is suitable for small areas, especially when using one of the magnify modes. Another way is to copy a block of the background over the area, if it can be done without ruining other parts of the picture as well. In some cases, you can simply use the eraser.

The eraser works just like the brush in draw; you select the brush shape in the menu screen but the color is always the background (leftmost box in the color palette). The eraser has a default brush shape, but you can change it by selecting any shape you want.

Eraser shares most of the same options as brush draw mode. If you select a mono fill pattern and click on the pattern box, it will erase pixels from the area you work in, leaving a background design the same as the pattern selected. If you have a color fill and the pattern mode selected, the eraser will simply act like a brush and paint over the area with the fill pattern, rather than just erasing it.

Eraser works in regular draw mode, even with slow draw but not magnify mode. To erase in magnify mode, simply select the background color and click on the pixel(s) you want erased.

To cancel the most recent erase, press UNDO before you press any other keys or mouse buttons.

LINES

Keystrokes: L, K and R

Lines extend straight in any direction from the first cursor location where you press the left mouse button to where ever you move the cursor and press the button again. They use the color and brush shape like the draw modes above, but also use the line pattern (or block, if toggled). To change the selected fill or line pattern, move the cursor to the box on the right of the screen and press the left button on one of the arrow keys on either side. You can cycle through the available patterns by holding down the left mouse button. Each arrow moves you one step in that direction through the series. Double-clicking in the pattern window also provides you with a dialog to choose your line or fill.

Lines can be drawn with both a fill pattern (color or mono) and a line pattern. The current fill pattern is shown in the box at the lower right, below the line pattern. To switch to the fill pattern, first click on the 'pattern' box beside the 'solid' box. To see the results best, use a thicker brush shape. Combining a broken line with a fill pattern often creates uniquely shaped lines.

Customizing fill and line patterns (creating your own) is described further on in this manual. Another important feature to refer to when drawing lines is 'snap', which establishes an invisible grid on which you align your start and end points of lines for more accurate positioning.

Lines using a block cursor are also affected by the line pattern. For example, a dotted line used with a block will place the block at regular intervals on the screen. Other effects such as shadow and mirrors work with lines. Experiment with the different combinations of brush and line shapes before you do any serious drawing.

Regular Lines

Keystroke: L

To draw a single straight line, position the cursor at the place on the screen where you want the line to begin and press and release the left mouse button. Now move the cursor to the position where you want the line to end. You'll see that a 'shadow' or 'rubber band' line attaches both points to indicate the position of the line when drawn. The shadow also shows you the current line pattern. When you press the left mouse button again, the line is drawn between the two points.

Press UNDO to erase the last line drawn if you make a mistake before you press either mouse button.

K-Lines

Keystroke: K

K-lines are continuous lines; they work exactly like regular lines but don't stop when you press the left mouse button. Instead, the line continues from the last point where you pressed the left mouse button. K-lines are excellent for drawing graphs or charts where connected straight lines are used for data display.

To stop the K-line feature and move the cursor without drawing a line, press the right mouse button. Press the right button again to return to the menu screen. K-lines are re-activated by pressing the left mouse button again. UNDO erases the last line drawn.

Rays

Keystroke: R

Rays are straight lines that all have the same central start point and draw outward from it. Press the left mouse button when you have positioned the cursor where you want the rays to be 'anchored'. Release the button and move the mouse; the shadow line follows. Press the left mouse button again to draw the ray. Move the cursor to the next location and continue drawing rays. The right mouse button cancels the ray feature; a second press returns you to the menu screen. Rays are re-activated by pressing the left mouse button again. UNDO erases the last ray group drawn.

SPECIAL EFFECTS

Airbrush And Stipple

Keystroke: A and S

Airbrush and stipple are special drawing modes. Airbrush paints a swatch of color on the screen like a can of spray paint, the color of the selected paint palette, using a circular cursor. Stipple has a similar effect but it works with the current brush shape. These features are especially useful for adding shading to three-dimensional objects like spheres. Double-clicking on stipple and airbrush command boxes brings up the customization dialog window.

When you draw with the airbrush, you do so exactly as you would in draw mode; with the mouse and the left mouse button held down. Like a spray can, airbrush continues to spray in one area as long as you hold down the button. If you don't move the cursor, then you eventually get a round dot of color. The faster you move the mouse, the fewer drops hit the screen; the slower you move, the thicker the paint. The paint is applied randomly just like a spray can. Slow draw works with airbrush to increase the paint flow in the cursor location. Similarly, the stipple effect depends on how long you hold down the button. Airbrush, since it paints a single pixel rather than a line, creates a 'finer' effect than stipple which paints a spot as large as the brush shape.

Both features can use either a solid or a pattern spray. If you select pattern, then the pattern in the box is sprayed in the area, randomly, but adhering to the pattern's outline. You can also use them with color fill patterns, in which case the current color in the palette isn't used. Double-click on the pattern display box and select color. Then choose a fill pattern to work in and watch the effect.

Airbrush works in brush draw mode (not block) and has it's own brush shape; a circle you select as small, medium or large. The size governs the cursor shape - the area where the paint gets sprayed. Flow governs the speed at which the paint fills the space you're spraying. Stipple repeats the current brush shape within the boundaries defined by the stipple range. You select the number of pixels from the brush to use the effect. Stipple works in block mode.

You can also adjust the speed of the flow in both airbrush or stipple box. They work with shadow and mirror features as well (but not both together) as well as change. Both can be used like the point mode, placing a random group of dots in the cursor area when you press the left mouse button and release it quickly. To turn airbrush or stipple off, click the cursor over their command box again. The UNDO key erases the last spray.

While not difficult to use, there are a lot of combinations and effects that you can get from airbrush and stipple. Smear is particularly effective with stipple, for example. Using either with change can result in some striking effects and very subtle enhancements to your picture. You should experiment with the various uses of brushes, speeds and patterns to understand their effect.

Mirrors

Keystroke: M

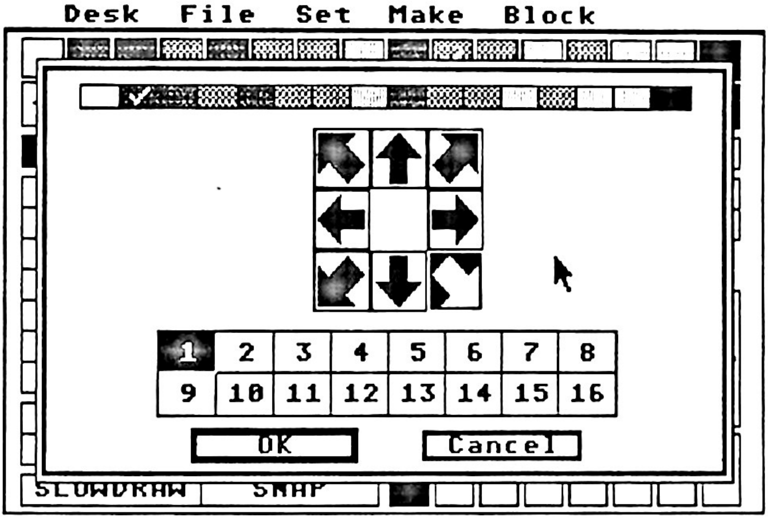
Like a real mirror, this feature reflects; it duplicates your drawing on another part of the screen. This is useful when drawing an image for replication in more than one part of the screen or in creating irregular but symmetric shapes. It can also be a lot of fun; the mirrors can make your screen behave like a video kaleidoscope.

The screen can be divided into "mirrors" with the exact center as the focal point. Double-click on the mirror box and select which type you want to use. The mirror type refers to where the image will be duplicated. If you have a horizontal mirror, then whatever you draw in the left or right half will be drawn in the same relative location in the other half, reversed. A vertical mirror splits the screen into top and bottom halves (drawing 'upside down'). A diagonal mirror reflects in the opposite quadrant (a quarter of the screen): if you draw in the upper left, it also appears in the lower right corner. If you combine all three, whatever you draw in one quadrant will be mirrored in the other three.

Mirrors work with all drawing, line, eraser and shape modes, although not together with shadow.

Shadow

Keystroke: H



Shadow duplicates each plotted point you draw, a set number of pixels away from the original point, in a color and direction of your choice. It uses the brush shape to determine the thickness of the line, if a line or brush is being used. It works with draw, point, line, shape and text modes.

Shadows can be adjacent or completely separate duplicates, depending on how far away you set them and the size of your brush. Shadows are automatically drawn when you click on the shadow box. With filled figures like disc, box or polygon, the 'mono' fill pattern is also shadowed 'behind' the original but not visible through it. This is good for creating 3-D effects with solid figures. A colored fill is not shadowed as a fill, but instead a solid shadow of the chosen color from the palette is drawn (read the section on fill patterns below to understand the difference between mono and color).

To set your shadow and select its color, double-click on the shadow box. Shadows can be directed to follow your drawing in any one of eight directions, and in any color in the palette (black and white in high-res). The shadow color can be different from or the same as the drawing color. Click on the arrow to set the direction of the shadow and click on the color palette. Then select the number of pixels away from the original to set the shadow.

Since there's only one 'color' in high-res mode, the best shadows there are obtained when you use them on top of a pattern. In low and medium res modes, shadows work better because you can use contrasting colors and shades. Shadow works well with other effects such as airbrush and stipple.

UNDO erases the last item drawn as well as its shadow.

Outline

Keystroke: O

This feature draws an outline around any color you click on, using the currently selected color from the palette. There are three options, selected when you double-click on the outline box: initial/all colors, touching/adjacent pattern and round/square corners.

Initial/all defines whether or not to outline only the initial color you click on to start the outline or whether to outline all colors touching it. Outlining stops when the program encounters the background color (the leftmost on the color palette). If you click on the background itself with initial chosen, then all colors will be outlined, except the background.

Touching/adjacent determines the method of search to determine if colors are nearby. Touching only searches horizontally and vertically, and the area being outlined must be more than one pixel wide, if drawn diagonally, in order to be outlined. Adjacent searches diagonally as well and will outline even thin diagonal lines.

Round/square determines how the corners of the outlined area will look. Round draws a diagonal line across square corners, square duplicates the corner exactly.

Outlines are very effective in business graphics, around text or to highlight parts of your drawing.

Snap

Keystroke: N

Alignment of lines, shapes, text and similar features is often inaccurate when just using the eye and hand. Snap provides a simple but elegant solution to the problem: an adjustable, invisible grid that 'snaps' your work to it. By double-clicking on the snap box, you see the grid size dialog where you can select a grid size between two and sixteen pixels. The grid is effective all over the screen, once established.

When snap is active, lines can only begin on a pixel that is on the grid. Circles and disc can only center on a grid pixel, frame and box corners can only be set on the grid. You cannot draw in any of the pixels between grid points, although lines and geometric shapes will draw between the grid points, even if they can only start and end on these points. In Draw mode itself, it is possible to draw diagonals between two grid points, but not irregular lines between them. Snap is most effective with lines, shapes and text.

You'll see your cursor jump around on the screen when snap is on; it can only draw on or between points on the grid. Snap also aligns the text cursor to its grid, so you can position your text more accurately.

FILL

Keystroke: Z

Fill does just that; it fills any enclosed area (or the whole screen) with the fill pattern selected in the box in the menu screen. Fill stops when it reaches color other than the one in the area clicked on (i.e. stopping at an outline or border) or the edge of the screen. Note that the 'solid' and 'pattern' concepts work differently in fill than in drawing modes.

Select Fill from the main menu. Go to the drawing screen and position your cursor inside the area you want filled. Press the left mouse button. The enclosed space is quickly filled with the chosen pattern.

DEGAS fills an area to the borders and borders have to be solid to prevent the pattern from leaking out into adjacent areas. A border is defined as a color area; DEGAS stops filling when it encounters another color or the edge of the screen. Make sure you have all the gaps sealed before you fill an area; use the magnify mode to inspect the border if you think there may be a hole. You can always erase the last fill before you return to the menu screen or press the left mouse button, by pressing UNDO on the keyboard.

The fill pattern in high-res mode is either white on black or vice versa; selected by choosing the color from the palette bar. If you also change the background with set color, you may find fill doesn't have the right effect or doesn't appear to work properly. It's working all right, but you just need to go back to the menu screen and select the proper color in order to display the fill pattern properly.

Using a color monitor, you select the mono fill pattern color by choosing one of the colors in the palette. You cannot fill an area with a pattern of the same color as the area itself; your area and fill patterns must have different colors. The color fill patterns can have up to the full number of available colors in each of them and their colors are independent of the color chosen in the palette.

Fill uses the solid or pattern mode set in the main menu screen to determine transparency. If set to pattern, then fill works like the 'X-ray' text feature; it will, where possible, fill over an existing pattern and still allow the picture to show through the background color. This allows you to combine several fill patterns for a new effect, as long as there are gaps for the pattern to leak through. Remember that a fill stops at any border. Also, the contents of the fill pattern determine how and where another fill will paint over it. Some experimentation may be necessary to find the results you want.

If solid is selected, fill paints over the picture with the background color regardless of what is below. Also, color fills ALWAYS paint over the background. Note that the solid and pattern modes have different meanings in draw and fill use.

If you hold the CONTROL key down before you press the left mouse button to fill an area, the fill pattern will be solid in the selected color instead of a pattern. This works even if you have chosen a color fill. UNDO also erases the solid fill if necessary.

GEOMETRIC SHAPES

Geometric shapes are generally regular, symmetric shapes like circles or squares. These shapes can be either outlines (circle or frame) or solid (disc or box). If outlines, they use the brush and line shapes and can use the fill pattern. If solid, they can be filled with a color or the current fill pattern.

Geometric shapes treat the modes 'solid' and 'pattern' somewhat differently than other drawing tools - they work like they do in the fill mode, above. If solid is selected, then everything drawn over another color or shape will paint over it and cover what's below. With pattern, however, it lets the painting below show through the background color in the fill pattern. This only works with 'mono' fills; color fills always act like a solid and cover anything below them.

To get a 'solid' (i.e. one color selected from the palette) fill using geometric shapes, hold down the SHIFT key while defining the shape, as described below.

Circle

Keystroke: C

Outlined circles and ovals are easy to draw with DEGAS Elite. Simply position the cursor where you want the center of the shape to be in a drawing screen. For accuracy, you might want to draw a single pixel point at that location first, so you can align the shape properly with the rest of your drawing (use the empty pixel in the crosshair brush pattern for alignment).

Now press the left mouse button in the drawing screen. Move the mouse in any direction; the circle or oval expands in the direction you move the mouse. The cursor remains visible in the leading edge of the outline box to show you which way you're moving. The outline box is merely to help you position the circle in your drawing; it disappears when the circle itself is drawn.

Press the left mouse button again: the circle remains in place and the outline box disappears. The circle or oval is fixed in that location; the right button erases it before you press the left button. A circle is not affected by the line pattern but is by the brush shape and whether solid or patterned mode is selected. The outline assumes the thickness of the brush shape and draws using the current pattern unless solid is selected. Circles may be plotted with a portion of their outline 'outside' the screen area; DEGAS will clip the outside but draw the rest.

If you want a perfect circle, not an oval (i.e. the radius is the same at all points), then press and hold the ALTERNATE key before you press the left mouse button to draw your circle. Now when you move the cursor, it will only go to locations which insure you draw a circle, not an oval. Release the ALTERNATE key and press the left mouse button to set the circle. UNDO erases it.

Disc

Keystroke: I

A disc is merely a circle filled with the selected color and fill pattern. It is drawn the same as a circle except it is not affected by brush shape. It will not appear filled until you press the left mouse button to fix it. When you fix it, the circle fills with the current fill pattern. If you press and hold the SHIFT key before you press the left mouse button, the disc is outlined as well as filled with the pattern. The outline is always the same color as the fill pattern, if it's a mono fill. If it's a color fill pattern, the outline is always the last color (rightmost) on the palette. If you want the disc filled with a solid color rather than a pattern, press and hold the CONTROL key before you press the left mouse button.

A disc is painted over any color or drawing material underneath it; it goes above any other material on the screen. You 'undo' a circle or disc with the right button before you press the left mouse button to fix it. If you press the left button and fix it, use the UNDO key to erase it.

Frame

Keystroke: F

A frame is a square or rectangular outline. You draw it exactly as you draw a circle; position the cursor where you want one corner of the box to be drawn. Now press the left mouse button and drag the mouse to enlarge the frame. The cursor appears at the leading corner to indicate direction. Press the left mouse button again to fix the frame or press the right button to undo it.

A frame is affected by both line and fill pattern and by brush shape. You can select a different line shape by positioning the cursor in the line box of the menu screen and double clicking or clicking on one of the box arrows to cycle through the available patterns. Experiment with combinations of both to see what results you can get.

Box

Keystroke: X

A box is a filled frame, like a disc is a filled circle; it uses the current color and fill pattern. You draw it exactly as you would a frame. It doesn't appear filled until you fix it by pressing the left mouse button again. Like the disc, you can create an outlined box by holding the SHIFT key before you press the left mouse button to fix the image. You can also fill the box with a solid rather than a pattern by pressing and holding CONTROL before you press the left mouse button.

You can also draw a frame or box with rounded corners; simply press and hold the ALTERNATE key before you begin drawing. The rounding won't show until you press the left mouse button to fix the box. Rounding can be used with SHIFT or CONTROL keys for outlined or solid fill.

Like disc, a box paints over anything drawn below it. You 'undo' a frame or box with the right mouse button before you press the left mouse button to fix it or the UNDO key after it has been fixed.

Polygons

Keystroke: G

Polygons are irregular, filled shapes. You draw a shape just like you use K-line; each press of the left mouse button starts a new straight line from the current cursor position. The right mouse button erases the lines and UNDO erases the figure entirely.

Polygons work slightly differently than K-lines, however. Your last point should be drawn within three pixels of your first point. DEGAS Elite automatically connects your starting point with the last point and fills the area with the current fill pattern and color. Another method of making connections is to press the RETURN key. DEGAS will link your last point to your first with a straight line; you don't need to worry about being three pixels from the first. If your lines overlap or cross, there may be areas which don't get filled.

To get an outlined polygon, press and hold SHIFT before you start defining the figure. To fill a polygon with a solid color rather than a fill pattern, press and hold the CONTROL key before defining it.

Polygons can only have a maximum of 25 line segments, including the connecting line between the first and last points. If you try to establish any more, the polygon erases itself and you have to start over again.

The polygon or irregular block mode works exactly like polygon draw for defining the block to be duplicated (described under blocks, below).

SLOW DRAW

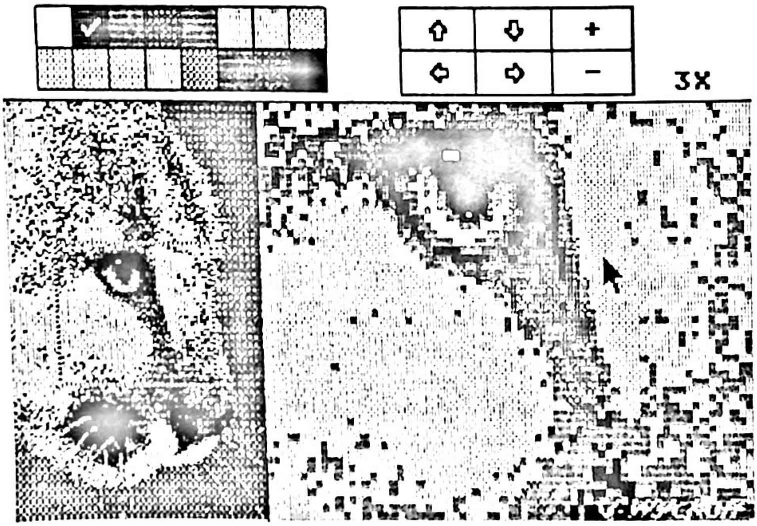
Keystroke: W

DEGAS is a fast drawing program; sometimes too fast when you're trying to be careful and accurate. In order to make things like aligning geometric shapes easier or in positioning the cursor in magnify mode, choose slow draw in the menu screen. To turn it off, return to the menu screen, press the left mouse button when the cursor is again in the slowdraw box (or press the 'w' key in a workscreen). Slow draw works with all DEGAS drawing and text features.

To change slow draw to suit your needs, double-click on the box and select a number from two to eight. The higher the number, the slower the draw (i.e. the higher the lag in the mouse travel across the screen).

MAGNIFY MODES

Keystroke: F1 to F10



Magnify is a special feature of DEGAS; it expands an area of your drawing to about a third of the full-screen size so you can work on it in more detail.

You enter magnify mode from any drawing screen by pressing a function key, and you return to the original mode you were working in when you're finished. To engage the magnify feature, go to the drawing screen by pressing the right mouse button (if you have a blank screen, then draw something to work with or load a drawing in first). Press a function key in the line of keys at the top of the keyboard (F1 to F10). F1 magnifies the area three times, F2 four times and so on until F10 magnifies twelve times. To cancel, press the right mouse button.

A small rectangle appears on the screen when you press a function key; this is the definition box; it frames the area of the picture to magnify. Use the mouse to move it around your drawing so the area you want to work in is inside the frame. Now press the left mouse button.

The area you selected is magnified and displayed in the right hand section of the screen. Left of it is the same section of the screen in actual size, so you can see the results of your work. The actual area being magnified is encased in a border so you can locate your work area exactly. At the top, on the left is the current color palette - this palette only affects the magnify mode screen; it doesn't change the color you're working with in regular drawing mode.

Each square in the magnified picture is one pixel large, no matter what the resolution. To change a pixel - to draw in magnify mode - move the cursor to the pixel in the right portion and press the left mouse button. The pixel becomes the color you selected from the palette.

If you keep the left mouse button held down, you can draw in magnify mode in the selected color just like the draw mode. UNDO in the magnify screen returns all of the most recently changed pixels to their original color. Unlike the original DEGAS, it doesn't change ALL the pixels; it now works the same as in the regular draw mode.

Watch the left side to see how your changes affect the real drawing. Magnify is very good for adding detail, for smoothing large text, touching up and erasing small areas of the screen.

The arrow boxes on the upper right and the arrow keys move the image a 'block' roughly one quarter the magnified screen size in the direction of the arrow, so you can move around the screen in magnify mode without having to exit to regular mode first. The plus and minus signs change the magnification one level up or down and the function keys jump directly to that level without leaving the mode. You can also move the magnified area by pressing the appropriate arrow key on the keyboard, and you can change the magnification by using the plus or minus keys on the keyboard.

To return to the drawing screen, press the right mouse button. You can then move the definition box to another location and magnify it or press the right mouse button again and return to the mode you were drawing in previously.

TEXT

Keystroke: T

When you load DEGAS Elite, the program checks a file on drive A called ASSIGN.SYS. This is a list of fonts to load with the program, which are also read automatically from drive A:. Customizing fonts and changing the ASSIGN.SYS file are described in more detail in the appendix on the font editor. You can load up to ten different fonts into the system, provided you have adequate memory. You may need to disable one or more desk accessories (especially very large accessories) and even reduce the number of workscreens to get more memory (hold the ALT key down when booting DEGAS Elite) to make enough room for your fonts.

The text feature is for positioning characters - a text font (letters and numbers) or graphics - on the screen. The text box in the menu screen shows you the current text shape, size and color. To change to another text size, simply click on one of the arrows beside the box. There are six sizes available in each font. The color palette is used to change the text color. Text always uses the solid mode, never pattern.

Double-click on the box labelled 'text'. This brings up the dialog box in which you select the type of text (x-ray or blocked) and the font style (underlined, thickened, lightened, skewed or outlined). Different style selections can be combined together to give you quite a range of font styles in which to work.

Text uses the ST keyboard for entry; you can use upper- and lowercase letters, punctuation and numbers. You can also use the Control key with the keyboard, but not the Alt key. The BACKSPACE key erases the last characters typed from the right end of the text, UNDO erases the entire text before you press any other mouse button. RETURN starts your text over again at the beginning of the next line down, so it doesn't overwrite initial text. Return also fixes the text on the screen to shift the cursor to a new location, press either mouse button.

You can write up to 80 characters of text in a single line, depending on the actual size of the text and your resolution. Lower resolution allows fewer characters in a single line. The cursor for text is a double rectangle which defines the maximum size in pixels that the font consumes. The lower rectangle is the space used by descenders. Not every letter will use all of this area, but it is useful to indicate the absolute limits in height and width a character may use.

A commonly used technique is shadowed or 3-D letters. This can be done very simply by using a shadow of a darker color with text. Other features work with text, including snap, slowdraw and cycle.

There are several sizes available for text, depending on the particular font. The color palette is used to change the text color.

Blocked Text

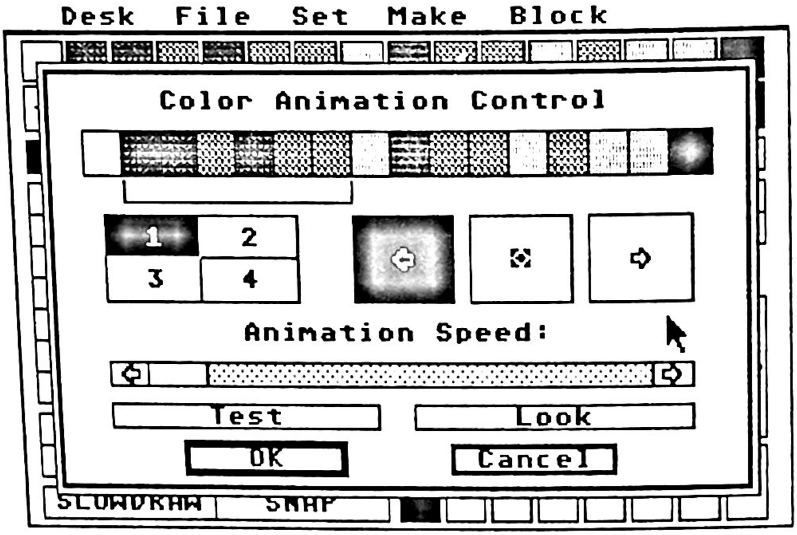
To print your text over the background and overwrite anything below it, select blocked text. Position the cursor where you want the text to appear and start typing. You can move the mouse and the text will follow; you can position text anywhere on the screen. When you press UNDO, it erases the entire line as does the right mouse button. The left mouse button fixes the text at the cursor location.

X-ray Text

X-ray text works just like blocked text, except that it leaves the picture intact beneath it. This means you can write over one color with another or fill a colored area with text in the background color. When you are using OUTLINED text, the text is automatically drawn in X-ray mode, due to a system limitation. This is usually not a problem, but if you need it to be blocked, you can type the text on another workscreen and use the BLOCK mode to grab it and place it where you like.

ANIMATION AND CYCLE

Keystroke: TAB and CONTROL + Y



Animation permits you to cycle a selection of colors in your palette automatically, in either direction and simulate animation, if your picture is drawn to suit such cycling. Double-click on the animation box to set the cycling parameters.

First, drag your mouse along a range of colors on the palette, left to right, holding the left mouse button down as you do it. This defines which colors will be in the animation group. Next, click on which group to use - one to four. You can set up to four different cycles, but only one marked will be active at any time. Next select the direction of the cycle; left or right. The center box is 'steady'; i.e., no animation.

The animation speed can vary between slow and very fast by sliding the box in the speed bar from right (fast) to left (slow). Finally you can test the effect on the palette with the test box and in your current workscreen with the look box.

When you leave the set animation dialog you can turn animation on by either clicking once in the animation box or by pressing the TAB key at any time in any screen.

Cycle is a drawing tool which uses the animation palette to define its colors. Set the palette as described above, then select draw, brush and a large brush. Make sure you have selected a color that is part of an animation group, not outside it. Now go to an empty workscreen and draw; you'll see the lines you draw are multi-colored; each color in the palette selected for animation is painted, in that order.

Cycle doesn't use the current animation group; instead, it checks which animation group that color is with and uses that group, even if it's not the one selected in the animation dialog. If the same color is used in more than one animation group, then the lowest numbered group is used.

Cycle also works with frame, circle, text, line, rays, stipple and many other features. However, in some, such as geometric shapes, the first object is drawn in the selected color, not drawn multicolored. The cycle effect takes place when each successive object is drawn; if you don't leave the screen, the next shape will be drawn in the next color in the palette. With text in cycle mode, it will only be printed in the next color after you press Return.

SMEAR

Keystroke: CONTROL + M

Smear is an effect, and is not actually dependent on the selected color. It uses the brush to 'smear' colors where they touch. It takes two adjacent colors and 'randomizes' their pixels in the area of the brush. The simplest way to show this effect is to draw a wide line of one color on a blank screen, then select smear (make sure you switch to solid first) and run the same brush along the edge where the two colors meet. Smear works best when used with the Stipple drawing mode.

CHANGE

Keystroke: CONTROL + C

Change gives you the ability to selectively change any color in a picture - no matter where it is - to any other in your palette. Double-click on the change box in the menu screen and select the color you want to change by clicking on it. Click on OK. Then select the color you want to change it to, in the main palette. Now select your drawing tool: change works with any drawing brush, stipple, lines and geometric shapes and airbrush.

Change works with mono and color fill patterns as well and the effect can be quite striking. It is a very powerful tool for adding special effects. You'll find it most useful when loading a picture from a higher resolution into a lower one with more colors. Using this feature, you can change specific areas, adding the additional colors where you want.

COMBINING EFFECTS

Many of the effects described above can be combined together and produce different results than when used alone or with simple draw mode. For example, Change combines well with airbrush and stipple and can change a color to a mono or even color fill pattern. The results of all of these combinations is not easy to describe in text; it's better that you experiment with them yourself on the actual screen. Try clicking on a feature in the main menu then clicking on the others to see what works with that feature. The effect a combination has also depends on the background, the brush shape, solid or pattern mode, color or mono fill and sometimes the animation group.

It may be a good idea to copy your picture to another workscreen and test an effect on a copy rather than on your original. The most important thing to remember is that most things can be restored with the UNDO key.

Note too, that several effects such as animation, change and cycle don't work in high resolution (monochrome).

BLOCKS

DEFINING REGULAR BLOCKS

Keystroke: ESC

Blocks are one of DEGAS Elite's most powerful tools. Basically, you can define any section of a workscreen as a block, up to a full screen in size. This block can be moved, copied to other areas or other screens, used as a brush for 'painting' or as an eraser, used in geometric shapes and manipulated by special commands.

To define a block, simply press ESC. This generates the movable horizontal and vertical lines that establish the start of the upper left hand corner of a block. Move the lines so that they are in the right place to start the definition, then hold down the left mouse button and drag the lower right corner of the box that appears to the desired location. It only moves down and to the right of the upper left corner. Release the button. The block is now defined. It also automatically toggles the system to block mode. If you don't actually grab a block, you can return to your previous mode. If you press 'B', it toggles you back to brush mode. The block only appears in block mode, 'attached' by its center point to your cursor.

If you press the Return or the left mouse button, the block will be 'set' or painted in its current location. If you press a number key, you move to that workscreen with the block intact. Or if you press the right mouse button, you return to the main menu screen where you can call the block menu and choose one of several manipulations on the block such as stretch and rotate. Finally, if you press ESC again, you undo the block and can redefine a new one. The block buffer is not cleared until you start redefining again.

POLYGONAL BLOCKS

Keystroke: SHIFT + ESC

Polygonal blocks are irregularly shaped blocks, rather than rectangular. You define them by pressing SHIFT plus the ESC key and drawing a border around your desired area exactly as you would draw a polygon. RETURN connects the first and last point. You can draw up to 25 line segments in this mode.

Polygon blocks work exactly the same as regular blocks except for their irregular shape. However, the block mode must be set to 'X-Ray', not blocked or a rectangular block results instead of an irregular one.

COPYING BLOCKS

DEGAS has a very powerful ability to cut and copy sections of your picture. You can copy a portion from one area to another, copy the same part several times or move a section around to another location on the screen.

To copy a portion of a drawing, go to the drawing screen and define a block using the method described above. If you press the left mouse button, it sets the the block in its current location. If you continue to hold down the button, the block acts like a brush and you can 'paint' with it. Undo cancels the block.

There are two types of block parameters: X-ray and blocked, selected when you double-click in the block box in the menu screen:

X-ray Background

X-ray makes the background color "transparent" in the block and lets the drawing underneath show through that color. This is useful for creating your own patterns; you can copy one filled area over another with unique results!

The background color is made transparent in low and medium resolution modes, but the other colors are not, so they cover whatever color on top of which they are placed. The background color in DEGAS is indicated by the leftmost box in the color palette in the menu screen.

Blocked Background

Blocked works exactly like X-ray except that the background is not transparent, so it covers up anything beneath the copy box.

Free Move And Edge Stop

This determines if the edge of the block will stop when it reaches the edge of the screen (edge stop) or if it can be moved off the visible edge (free move) at least as far as the cursor.

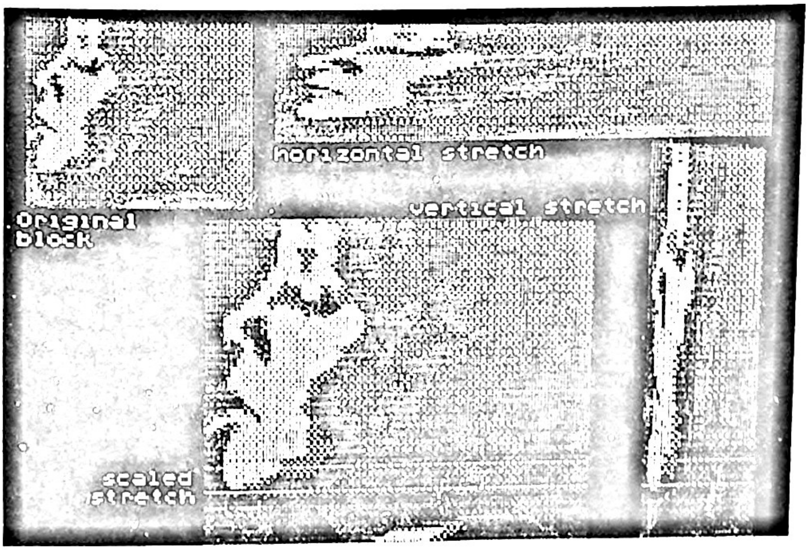
MULTIPLE COPIES

You can make more than one copy of the same area very simply with DEGAS: simply define the block as described above and move it to the new location. Press the left mouse button (or Return). This duplicates the copy box below its current position but still allows you to move the original block to another location and copy it there as well. This feature works equally well with X-ray and blocked modes.

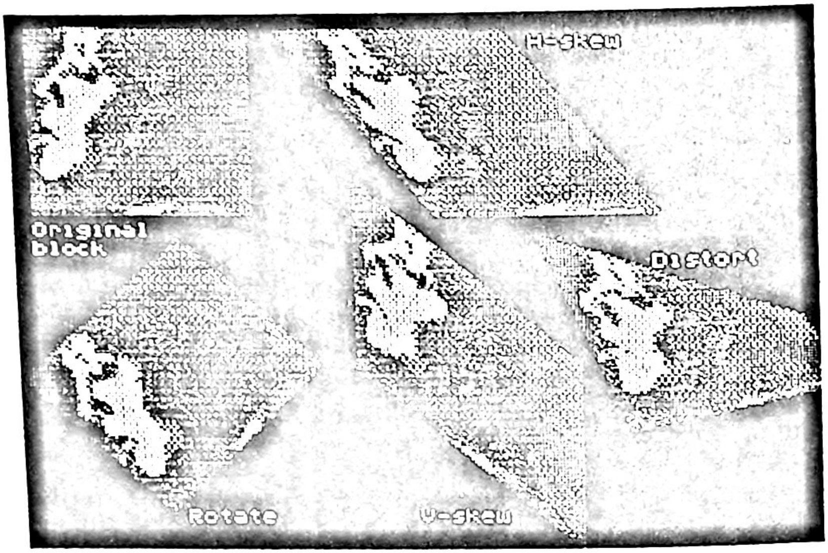
BLOCK MOVES

To move a block, define it as described above but hold down the ALT key while you define the block. Move works just like block copy except that it picks up the rectangle you define with the mouse and cursor and doesn't leave a copy of it behind. When you press the left mouse button or Return, the area is fixed in its new location and the area where it was previously is returned to the background color.

You can also make multiple copies with move like you can when you copy a block. To return the section copied back to its original location, press UNDO.



BLOCK MANIPULATIONS



Arrows

Define a block and go to a blank workscreen so you can best see the following effects. Press the up arrow key. The block is inverted in that direction. Try the different arrow keys; the block gets faced in the direction of the arrow. Undo cancels the effect.

The Block Menu

Once you have a block defined, press the right mouse button and exit to the main screen. The block pull-down menu has several other features you can use to alter the shape, size and facing of any block: stretch, rotate, horizontal and vertical skew and distortion. Try each one in turn as you read the descriptions below. To restore the block, press UNDO. To 'set' or fix the block once you have changed it, press the right mouse button and return to the main menu.

Note that once you select a type of manipulation to perform, you enter a blank screen (the block buffer) in which to work. If you change your block with one of these features, Undo always restores it. You can redefine a block within the changed block in that screen by pressing ESC. You can then apply the current type of manipulation to the new block and continue until you're satisfied. However, UNDO only restore the LAST block defined, it doesn't restore back to the original block if you've defined other block areas since. UNDO also halts a block manipulation in the process and restores it without continuing.

Be aware that some of these manipulations take several seconds to perform and the larger the block, the longer they will take to complete. Be patient.

Stretch

This places the block into the upper left hand corner of an empty screen (the block buffer). To stretch the block, use the mouse and click on the lower right corner. An outline appears around the block. Now hold down the left mouse button and move that corner anywhere else on the screen and release the mouse button. The block will be drawn to the size of the outline box.

You can also simply position the cursor on the screen and click the left button. The block will be dawn so its bottom right corner is located where the cursor was when you clicked.

Pressing the CONTROL key before starting the stretch operation will preserve the block's shape; that is, its width and height relationships will stay the same, it will simply be scaled larger or smaller.

Pressing the SHIFT key before starting a stretch operation will stretch the block horizontally ONLY — the block's height will remain the same.

Pressing the ALTERNATE key before starting the stretch operation will stretch the block vertically ONLY — the block's width will remain the same.

Click the right mouse button to return to the menu screen once you have the block stretched. This 'fixes' the block at the new size. Once you enter a workscreen, the newly sized block is available for placement or drawing.

Rotate

Grab any corner of the outline box when you press the left mouse button and rotate the outline clockwise or counterclockwise an number of degrees. When you let go of the mouse, the block is remapped into an area of the same size, but with the new angle you define. The degrees of angle are shown in the upper left corner of the screen. Click the right mouse button to return to the menu screen.

H-Skew and V-Skew

Horizontal and vertical skewing allows you to offset either the top and bottom of a block (moving them horizontally, or h-skewing right or left) or the sides (moving them vertically, or v-skewing up or down). Grab a corner with the mouse and move it. The opposite face will be moved automatically the same amount in the opposite direction as you do this. When you release the button, the block is skewed.

Distort

Distortion lets you move each corner of the block to a different location on the screen and distort the original image quite radically. You can even overlap sections of the block itself and 'fold' the image. Grab a corner and move it while holding down the left mouse button. Release the button when you reach the location you want. When you've moved all the corners you want, hold down the ALT key and click the left mouse button. The block will be remapped into that area. This process can take a modestly long time, so be patient.

Format, Load, Save, and Remap

You can save and load blocks just as you would a picture file. Blocks are saved with the extension **.BL1**, **.BL2** or **.BL3**, depending on the resolution you're working in. The color palette of the block is saved with the image.

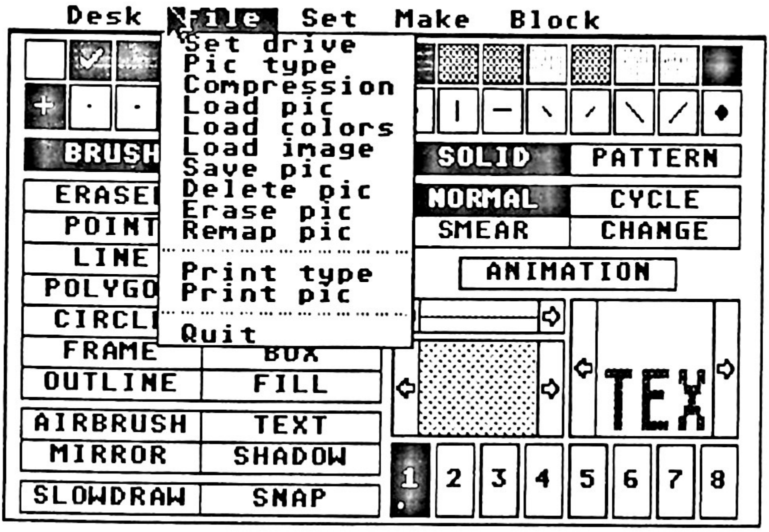
When you load a block, you get an option to recolor it using the best available matches in the current color palette (this is further explained in the section on files, below). If you say no, you can always recolor that block later, by using the remap menu command. A block can only be loaded if the block's resolution matches the current screen resolution; an icon file (.ICN extension) will load into any resolution.

The format command allows you to save a block as either a graphics block (for use in DEGAS Elite or compatible graphics programs) or as an icon (a 'C' file for use with the Resource Construction Set and other utility programs or in your own programs). The RCS has a limit on the icon size, but you can use any size in your own program. An icon is a monoplane image; it has no color palette saved with it. Any colors in the block you save as an icon all become the rightmost 'color' in the palette in any resolution. It's a good idea to reload your icon after you've saved it, to make sure it looks right in one color.

THE PULL-DOWN MENUS

There are no keyboard equivalents for the pull down menu commands, since many of them require additional input or information. They can only be used from the main menu screen.

FILE



Set Drive

This allows you to set the default drive (not path) from which to load and on which to save pictures and blocks. Drives A through P are supported, so RAMdisks and hard drives can be used with DEGAS Elite. Disk use and files are explained in the next chapter.

Pic Type

You can load several different types of pictures, including other resolution pictures into the resolution you're using by specifying the type of picture it is before you load it. The default type is always the resolution in which you begin. **PI1**, **PI2** and **PI3** are low, medium and high resolution DEGAS pictures, respectively (it doesn't matter to the pic type if the file is compressed or not). You can also load in pictures made with Atari Neochrome, 8-bit Koala Pad (tm) pictures ported from an Atari 800, 800XL or 130XE computer or Amiga .IFF format pictures (using Electronic Arts' file format). Pictures are always saved in the current resolution as a DEGAS file with the proper extension to identify them.

Compression

DEGAS has an automatic compression routine which reduces the size of a standard picture file from roughly 34,000 bytes to anywhere between 10,000 and 24,000 bytes. You can turn compression off if you want to save a picture in normal (uncompressed) format. DEGAS Elite reads either compressed or uncompressed files without requiring you to set anything before.

Compressed DEGAS pictures are saved with **.PC1**, **.PC2** or **.PC3** extensions, depending on the resolution. Compression on or off only affects how the picture is saved, not loaded.

There are several reasons to use or not use compression. Some word processors now allow you to include graphic files such as DEGAS format pictures in them. They usually require an un-compressed picture. The same is true with several graphic display programs (**SHOWPIC2.PRG** can display compressed and uncompressed pictures). Translation programs which allow you to turn DEGAS pictures into other format files require un-compressed pictures to translate properly.

On the other hand, compressed pictures take up about a third less space on a disk, so it is more efficient to store files as compressed and "un-compress" them only as you need to.

Load Pic

This is used when loading a complete picture (image and color palette) into workscreen one. When loading into other workscreens, this is disabled and you use 'load image' (below). See the section on the disk which explains files and folders. In other workscreens, this option is 'greyed-out and unavailable in the pull-down menu.

You have to make sure your picture type is established before loading a picture. When you load a picture saved in a different resolution from the one you're using, the load takes several seconds to process and adjust; you'll see the picture being drawn line by line as DEGAS Elite processes it. In monochrome or high resolution, colors four in medium or low resolution pictures are replaced with fill patterns which attempt to match the color densities in the original.

Load Colors

When you load an image into a workscreen other than one, it does not load the file's color palette. However, you may want to load the palette separately or use another palette from the disk for your picture. Palettes are saved with the picture files, so you click on the picture name, not a specific palette name. Palettes cannot be saved separately; they exist only as part of a picture. A new palette always overwrites the existing one.

Obviously, in monochrome, there is no load colors option.

Load Image

This loads the picture image without the color palette into any DEGAS Elite workscreen currently selected. In low and medium resolutions, if the palette of the picture is not the same as the one in use at the time, then you are asked if you want the program to try to recolor (remap) the picture using the closest matches it can find in the existing palette. This is usually quite a close match if matches are at all possible. If you say no, the image is loaded and no re-coloring takes place. You can always recolor the workscreen later with remap (below).

In high resolution, since there is no color palette to load, you aren't asked if you want the image remapped and recolored. Instead, colors are replaced automatically with mono fill patterns in an attempt to match the shadings with fills of different densities.

You can load an image into workscreen one, by the way; this preserves your existing palette and only loads the picture.

Save Pic

This saves the current workscreen and the current palette to disk using the appropriate resolution extender. No matter which workscreen you save, the current palette loaded with the picture in workscreen one (or the default, if nothing has been loaded) is saved with the picture. If you have compression turned on, the picture will be saved compressed with a .PC extender. Click on a name in the display or press ESC to clear the line and type in your own name if the name on the item selector box is not one you want to use.

Delete Pic

This deletes a picture from the disk. You select the picture in the same manner as when you load a picture. You are asked to confirm the deletion before it is done. Be careful! Once deleted, a picture cannot be restored. You can delete a picture in any resolution, not simply the one you're currently using.

Erase Pic

It's easy to erase the selected workscreen; simply select the erase pic command. You'll be asked to confirm it by positioning the cursor over the "OK" box in the window that pops up and pressing the left mouse button. Be careful; you can't 'undo' an entire screen erase!

Remap Pic

This attempts to recolor the picture in the selected workscreen using the current palette, in the same way it does when you load an image. The program attempts to find the closest match among the entire palette, then changes all the colors to suit the new match. Remapping an image can take several seconds, as the computer examines and changes each pixel in the picture, so be patient.

If you loaded an image into a workscreen and didn't recolor it at the time of the load, you can select that workscreen and try it now. You can also try to recolor a picture in workscreen one after you've loaded a new color palette. The remapping process is 'intelligent'. That is, it tries to match a color on the screen with a color in your palette and if it can't find an exact match, it searches for the closest one. Blocks have their own remap option and when you load a color fill, you have the option to remap it as it loads.

Print Type

This allows you to load the proper printer driver from the disk, just as you would load a picture file. Several drivers for popular printers are supplied on the disk and others are available on the Atari 16 bit SIG on CompuServe. Registered owners will be informed of new printer drivers as they are released. Once a printer driver is loaded, you don't need to load it again unless you change printers while you're working in the program. It only needs to be loaded once each time you load DEGAS Elite, before any printing. Drivers have a .PRT extension.

If you are using a typical dot matrix printer with a single color ribbon, you won't get colors in your picture. DEGAS will print the different colors in shades of grey instead. Some printer drivers allow you to print either vertically or horizontally by holding down the ALT key before choosing Print Pic. These are noted in the appendix listing the printer drivers themselves.

Print Pic

This prints the picture in the current workscreen on your printer. You must have loaded the proper printer driver first. Make sure your printer is hooked up properly and online. With some printers, holding down the ALT key before you select print pic allows you to print the picture vertically on the page. This is noted in the appendix on printer drivers. If your printer isn't ready, the system will 'hang' for about thirty seconds, then control will be passed back to the program again.

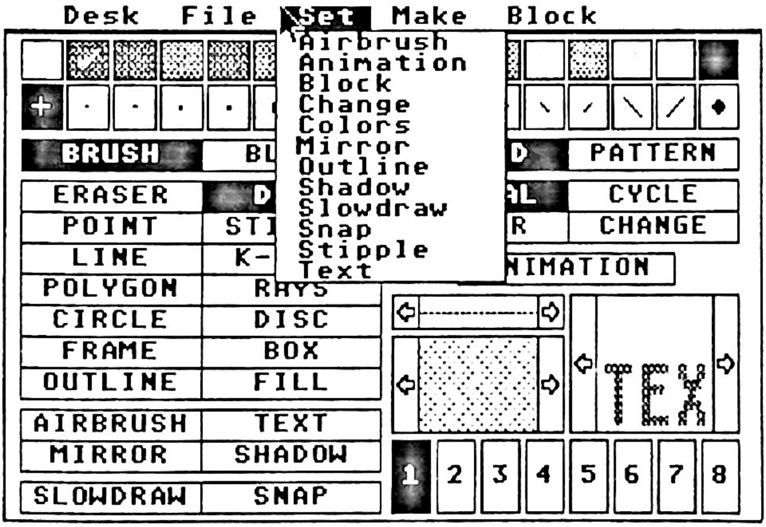
If you press the UNDO key during a print operation, the print will be cancelled and you will return to the main menu screen.

Wait for the cursor to return to normal before continuing or removing your picture.

Quit

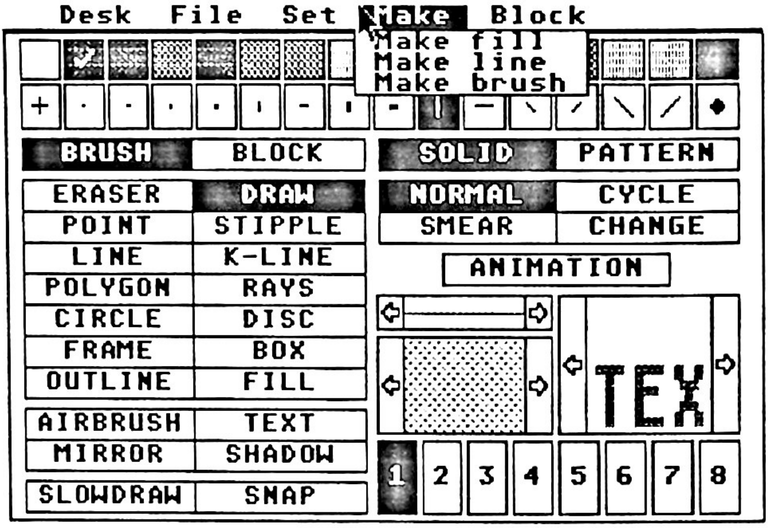
This is the only way to properly leave DEGAS Elite. Never simply shut the machine off with disks in the drive.

SET



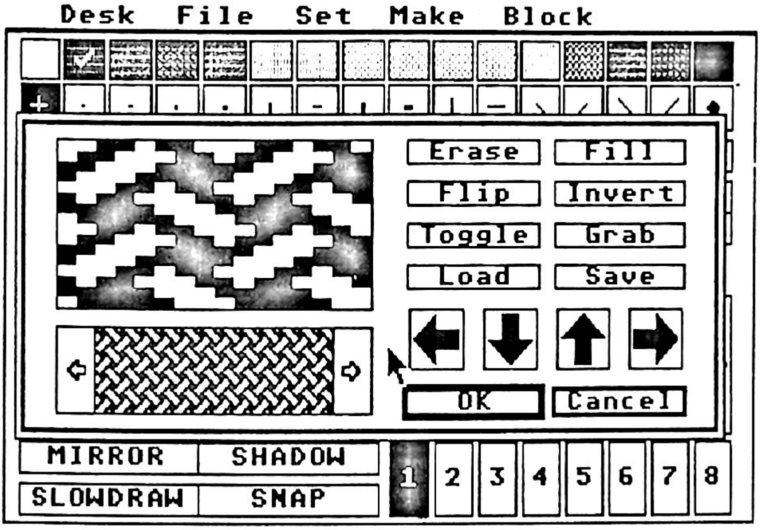
The Set menu features duplicate those available by double-clicking or clicking with the ALT key held down in the command boxes in the main menu screen and all described in the earlier parts of the manual. They are provided as another way to get to the commands and dialog boxes and don't offer any more features simply because they're available through a menu. Use which method seems best for you.

MAKE



Most features in DEGAS can be altered to suit your own personal style quite easily. The Set and Make menus give you almost complete control over every feature in the program. Make allows you to design custom fill patterns, lines and brush shapes.

Make Fill



This allows you to create a fill pattern of your own. First, select a fill pattern to change or replace. You can change any of the 36 different patterns in both mono and color but you can't have more than 36 in each. Make your choice, then click on Make Fill.

The window that opens up is the fill pattern creation window. It shows a magnified version of the current pattern and below it a sample of what it looks like in normal size. There is also a color palette (if a color fill was selected), boxes for erase (clears the entire design), fill (fills either with the selected color or all black if mono), flip (flips right to left) and invert (flips top to bottom), toggle (reverses colors). You activate these features by clicking in the box.

The arrows on the side of the lower display allow you to select a fill pattern in that direction from the available choices. Clicking on these arrows rotates the display through all available choices.

Grab returns you to the current workscreen and provides a small fill-sized box for you to position over the desired area. Press the left mouse button and this area is 'grabbed' and you return to the dialog with the area now in the pattern box. Click the right mouse button to return without grabbing anything. Note that if you are editing a monoplane fill and grab a section of color, you'll probably get nothing but a solid black fill pattern. Monoplane uses background and the rightmost color only in the make fill process.

To edit a pattern, click the cursor in the magnified display box. It works like drawing in magnified mode in the workscreens. In mono patterns, the pixel where you click is reversed - black to white and vice versa. In color patterns, the pixel becomes the color selected from the palette above the image. All available colors can be used in color fill. A fill pattern is 16 by 16 pixels.

The four large arrow boxes at the bottom move the entire display one pixel in that direction. When the pattern reaches one side, it 'wraps' around the edge and appears on the opposite side.

You can load and save a single fill pattern just as you would a picture. The extender for filenames of mono fill patterns is **.FIL**, color fill patterns are either .FI1 or .FI2, depending on the resolution. You can only load a color fill pattern of the current resolution. The palette for a color fill is saved with it and you can remap any color fill you load, just like an image or a block (you can't remap a fill pattern later, however).

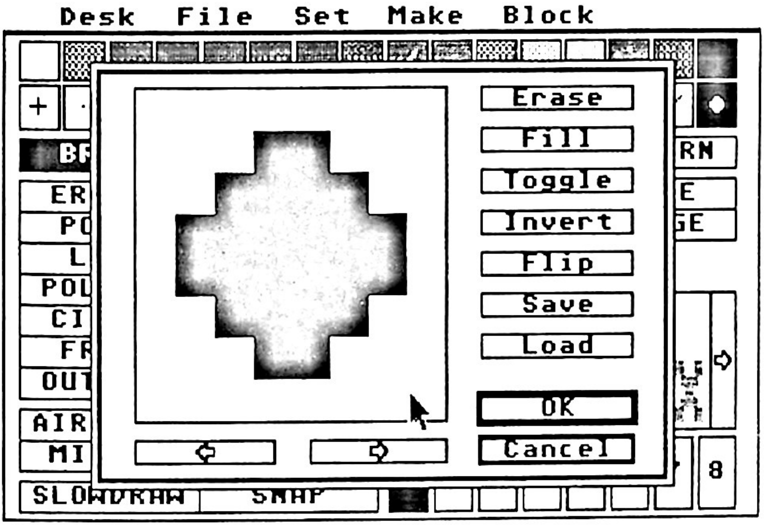
If you've already used a fill pattern in your picture, it will remain that way and won't change when you edit or load a pattern over that selection. You don't change something you've already used in your drawing when you change the fill pattern later.

Make Line

First, select the line you want to change or replace from the line display box by double-clicking in it.

A line is a lot simpler to change than a fill pattern: it's simply a thread of 16-pixel segments. You turn each pixel on or off by clicking in the magnified display box. The arrows cycle you through the line types one at a time when you click on one. There are no other options for lines; they're very simple to adjust and edit.

Make Brush

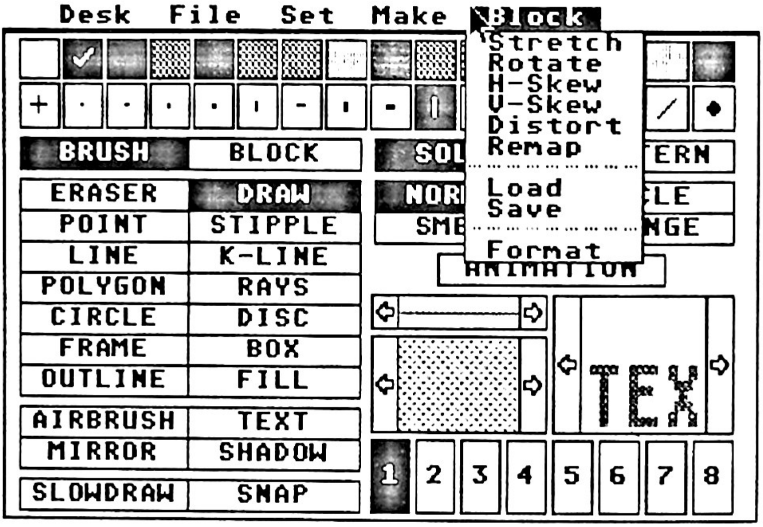


This works in a similar manner to the Make Fill feature, described above, except it works only in monoplane mode. You can select any brush on the line except the first (the crosshair) to edit or change. If the crosshair is selected, this feature is greyed out until another brush is chosen. The boxes erase, fill, toggle, invert and flip all work the same as in make fill.

Note that there is only one 'color' in a brush, so toggle simply reverses the brush and the background colors. multi-color effects can be had by using the cycle or change features or using a block as a brush. A brush shape is eight by eight pixels.

You can load and save a single brush design to disk like you can fill patterns. The filename extender for brush files is **.BRU**. A brush shape can load into any resolution.

BLOCK



These features were all described earlier, under the section on defining and drawing with blocks. You must have a block defined for the manipulation features (rotate, stretch, h-skew, v-skew, distort and remap) to work. Note also the difference between block and icon format files, as described previously.

You can load and save a block, like you can a picture, with its own color palette. You can select to save it as an icon (for use in the Resource Construction Set or other programs) or as a block using the format command. However, you can only load a block into its own resolution. An icon file can be loaded into any resolution, but unlike a block, an icon is only mono-colored.

APPENDIX A:
A Basic Guide To The Disk

This section is intended for users who are new to the ST or for readers who want some basic understanding of how disks and files are used.

When you save, load or delete a picture or block file from disk, DEGAS produces a window which shows you the current disk and folder you're using and a list of any pictures on disk in the current resolution mode. The directory of pictures has scroll bars which work just like the scroll bars in your desktop. If you're not familiar with using scroll bars, read your ST manual for more information.

The default folder is called **\DEGAS**. This is preceded by the drive identifier (like A:). If your pictures are stored in another folder or simply in the root directory, click on the small diamond shaped box in the upper left of the window to close that folder and go to the root directory. If you need to open another folder, click on its name in the display (folders are identified with a small diamond icon beside their name).

Setting the drive from the File pull-down menu establishes the default drive the program will save to and load from. You can change this anytime. It is really only a convenience; you can load from one drive and save to another if you wish. You can change the default drive name in the file selector box by clicking the mouse on that line and using the ESC key to clear it. Then type in the drive (and folder) you want to use. Click the mouse on the grey bar above the filenames to activate it (don't press Return).

Pictures have three character extenders to their names which define the mode: PI3 is high-res, PI2 is medium and PI1 is low-res mode. Compressed pictures are called .PC1, .PC2 or .PC3. Blocks are called BL1, BL2 or BL3. Brushes and mono-color fill patterns have the extenders .BRU and .FIL respectively; color fill patterns have extensions of .FI1 (low-res) and .FI2 (medium-res). Icons have .ICN extenders.

You don't have to type in the extender; DEGAS will automatically append the correct extender for your resolution mode. If you try to use a different extender, DEGAS will warn you and you'll have to try again or change your picture type from the file menu. You can't save or load a picture with the wrong resolution mode extender either!

The name of the picture to be saved, loaded or deleted will appear in the space under the word "Selection:" when you either type the name or click on it from the directory. If you want to use this name, move the cursor to the OK box and press the left mouse button. If you want to use a different name, then use the ESC or the backspace to delete the characters of the name (unless of course it's already blank) and type in the name you want.

You can also move the cursor over to the name in the directory box and double click the left mouse button. This will save, load or delete the picture with that name.

You can load and save a block, like you can a picture. You can select to save it as an icon (for use in the Resource Construction Set) or as a block using the format command.

SAVING A PICTURE

To save your drawing to disk, first place your picture disk in the disk drive. In the menu screen, select "SAVE PIC' from the file menu. A window will open showing you all of the pictures on the disk in that resolution mode. Follow the procedure described above for choosing a name for your picture. Be careful: saving a picture with a file name already used causes the one on disk to be erased and written over by the one you're saving now.

If you save a picture with the same name as one already on disk, you'll be asked to confirm that it's okay to replace the picture on disk with the one in memory.

A picture is saved in compressed format, unless you select 'normal' or uncompressed. Compressed pictures take up less space on a disk, but many outside programs need uncompressed pictures to work with.

Make sure you have enough space on your picture disk before you load DEGAS.

LOADING A PICTURE

Loading a picture is the opposite of saving one; you call up a picture from disk to the drawing screen. You can only load a picture which matches your current picture type, so the directory will only show you those pictures with the proper extender. If you want to load a picture with a different resolution or type, change the picture type first. Loading a picture from disk erases any one currently in memory in that workscreen, so be sure to save your picture first if you want to keep it. You'll be asked if it's okay to load the picture from disk over the one in memory before it happens.

DELETING A PICTURE

You can delete a picture from disk by selecting it the same way you save or load one. You can delete pictures with other resolutions than the one you're in at present. Be careful; deleting a picture file is irreversible, so make sure you really mean to delete it. Before you actually delete the picture, DEGAS asks you to confirm or cancel the action.

SETTING THE DRIVE

This feature allows you to define a default drive that the program will always use for loading and saving. This is a convenient way to avoid having to enter a drive name and folder every time you do any file I/O.

When you first load DEGAS Elite, the default drive is always the one from which you loaded the program. It assumes a folder called DEGAS is used to keep your pictures and other files. Folders are a convenient and efficient way to organize your disks and files.

If you set another drive after loading, DEGAS Elite assumes the same folder is on the other drive. To go to the 'root' or main directory, click in the small diamond-shaped box above the filename display area. It is possible to clear the entry lines in the item selector box and enter your own drive and folder names, using GEM rather than DEGAS Elite to control disk access. However, if you're not familiar or comfortable with this method, we suggest you use the easier 'set drive' method instead.

BOOTING THE PROGRAM

When you turn on your computer, you need to have several things on the 'boot disk' in drive A: (your only drive if you have a one drive system). These are:

- The AUTO folder with the **GDOS.PRG** file in it
- The **ASSIGN.SYS** file in the root directory

The GEM fonts you intend to load should be in a folder or the root directory of the disk in an active drive when you boot. If you have one drive, these should be on the boot disk in drive A:. If you have two drives or a hard disk, they can be in any drive, as long as the path is properly named in the ASSIGN.SYS file.

The **ASSIGN.SYS** file is a list of font files to load when DEGAS Elite loads. These must be the same as the font files on the disk. It should be in any folder. It is described in more detail in the appendix on page 66. When you boot the disk properly, your screen displays "GEM DOS INSTALLED" (or a similar message) before you see the desktop. If it doesn't, make sure **GDOS.PRG** was in an auto folder on the boot disk.

IF you load DEGAS Elite without GDOS, the program runs but won't be able to use any fonts other than the inherent system font.

The program **ELITE.PRG** and its resource file, **ELITE.RSC** can be on any disk in any drive, but must be together on the same disk, wherever it is. You can load and save pictures, icons, brushes, fill patterns and everything else on any other disk in any drive, including hard drives and RAMdisks.

When you load the DEGAS Elite program, it immediately reads the font files from the disk in drive A:. Leave the boot disk there until these files are read, otherwise you won't have any fonts except the system font. Once they've been read, you can remove this disk and replace it with another to save your pictures. If you change the ASSIGN.SYS file to add or delete fonts, then you *must* reboot the system in order for these changes to take effect.

If you boot DEGAS Elite while holding down the Alternate key, you can reduce the number of workscreens available, to allow more space for fonts.

APPENDIX B: Suggestions

HINTS AND TIPS

Drawing with DEGAS is remarkably easy. You can create some amazing works of art with a little patience and experimentation. Learn to use all of the features first, before you go on to draw your masterpiece: tinker with different effects from line and brush shapes, test shadows and make your own fill patterns. Every moment you spend getting to know the system will make using DEGAS that much easier when you try your hand at some serious art.

DEGAS is well suited for such things as perspective drawing; you can use the ray feature to draw lines from the vanishing points with ease. Shadows can be added to give extra depth and realism to a picture. Shadows used with large brush sizes are excellent for 3-D effects.

Magnify mode is very useful for cleaning up your pictures and adding that detail which makes the difference between good and great art. Use it to smooth curves, tidy type, add shadowing and when aligning your art to specific points.

When you use the text mode and a particularly large text, you may find the result blocky and not very attractive. With magnify mode, you can simply alter the text after you've placed it on the screen, rounding edges, filling in portions where it is 'chunky'. You can also add thin shading effects to text in magnify mode or with the outline command. Different types of text present different effects - try working with skewed or outlined instead of regular text, or try using a different font.

Simple outlines around geometric shapes can make your artwork stand out and look more professional. The same goes for borders; you can create a hollow border with two frames, one inside the other and display it like that or filled with a pattern. You can round the corners by drawing circles centered on the inside frame then erasing the extra for another effect. A simpler method is to hold down the ALTERNATE key when drawing a box; that gives you rounded corners automatically.

If you're trying to draw professional graphics like charts or graphs, you may find it easier to draw a frame around the working area of the screen and then turn on the grid effect. Use the grid to align your drawing. You can even vary the grid size in a drawing for different purposes - say a large grid to align large text labels and a smaller grid for more detailed work.

If you want to be able to see the drawing screen borders, separate from the background color, then first change the background color (the leftmost box on the color palette) to a color different from that in which you want to work (say a green or blue). Then change another color on the palette to that on which you want to draw - say white. Now exit and choose 'fill'. Go to the drawing screen and fill the entire screen with the last color before you do any drawing. This will give you a clean art area with a distinct border.

To locate the exact center of your drawing screen, select the 'all three' mirror mode and line drawing. Start your line anywhere on the screen and move the mouse so that the line crosses over to the other side of the screen; top and bottom. If you play with the mouse a bit, you'll find the lines intersect at one point only; that's the center. Press the left mouse button to fix the lines when they intersect. You can then use magnify mode to color the center if you wish and the eraser to erase the lines you drew to find the center.

The brush shape can be used to generate special effects; you can change the shape to one you want and use it with point, line or draw, even geometric shapes. The **MAN.BRU** file is a 'man' brush shape you can use with point to scatter small figures over your screen.

You can create some nice effects using the mono fill patterns and filling one pattern over another - especially noticeable if the two patterns are different colors. This can be quite striking. The color fills give you an enormous range of effects to discover.

Text display also works with the CONTROL key; press and hold it when entering your text to see what other characters are available for display. There may be more to a character set than you realize!

There are several DEGAS picture files available on CompuServe's SIG•ATARI (many by Tom Hudson himself) and others will likely be on other bulletin board systems soon. These are useful for filling out your picture library and to give you some ideas for your own art by seeing how other artists have done theirs.

You can define a whole picture as a block, then use stretch and reduce it down in size to one quarter or even one eighth of the original size. Paste it into an empty screen. Load another picture (or image) and do the same, pasting it beside the first block, but leave some whitespace around the pictures to add a line of text. Keep on until you've filled the screen. Now use text to add the picture's filename to the block. You can build a visual library of all of your pictures this way!

Block libraries are as important as entire pictures themselves. With a combination of blocks, fill patterns and brush shapes, you can build a personal 'toolbox' of features, images and effects.

If you're customizing or editing a picture, define it as a block, then copy it to an empty workscreen. Now you can work on a copy and leave the original intact. This way, if you make a mistake you can't undo, you can go to the screen with the original and copy it back again without having to load it from disk. It's also a good idea to save the original and the working version as separate files until you're satisfied with the changes. Then save the latest version as the new 'original'.

For small movements of the cursor, use the ALT and arrow key combinations, or SHIFT + ALT and arrow key for one-pixel shifts. This gives you greater control over precise movements than the mouse.

Once you learn the keyboard commands, you can toggle or initiate a feature from a drawing screen without having to go to the main menu. Remember that some features toggle other modifiers such as solid or pattern.

Change is a very powerful feature. You can use it as a solid or a pattern, with airbrush or stipple; its range of effects is amazing. You should explore this feature more thoroughly to see how you can use it in your pictures. Change is very useful for adding colors to a picture when loading medium or high resolution pictures into a low resolution screen.

Many features combine to create quite different effects from what they appear to do alone or with simple draw/brush combinations. Experiment with the combinations to see what works best for you.

Sometimes you want to work with a larger brush than is available from the shape palette. The easy way to do this is to draw the desired brush (circle, disc, box or frame are very useful here if you want a symmetric brush shape) in an empty workscreen, then define it as a block. Use block in draw mode. One caution: drawing with blocks is slower than with a brush, so do it carefully. It's easy to 'outrun' your block with your mouse and then have to wait while it tries to catch up.

PROBLEMS

One of the first things to make sure of when using DEGAS is that you're not trying to draw or fill using the background color. If you try to draw over one color with the same one, nothing will show!

Remember that you can undo a mistake with either the right mouse button or the UNDO key, depending on the feature you're using. try UNDO first; it may even interrupt the process taking place and stop it in the middle, so you don't have to wait until it's finished to undo it. Don't go to the menu screen or another workscreen before you try to undo an effect; if you do, you won't be able to undo anything.

Examine the space on your disks to make sure you have enough room to save pictures; each uncompressed picture takes 32K of space on a disk, each compressed picture about 24K. It's a good idea to make backup copies of your art as you go along - before you try to make changes. That way you always have a copy to work with if something goes wrong.

It's a good idea to save your picture frequently as you work on it; that way, if you have a power failure or other problems with your machine, your art won't be completely lost.

Keep backup copies of your art on separate disks, even that which is still in the drawing stage. Nothing is more frustrating than losing a picture because of a disk failure.

When working on a picture 'in progress', copy it first to another workscreen, then work on it. If you're not satisfied with the changes, you can restore the original from the first copy at any time and start again. Use the screen name feature to help remember which picture in which workscreen is associated with a particular file.

Finally, make sure you set your screen resolution, mouse click time and key press before you load — in the GEM desktop mode. If you find the computer doesn't respond well to the mouse click or key press, try making it either slower or faster and see if that works better.

If you can't get the fonts to load properly, re-boot the system with GDOS.PRG in the auto folder. Make sure the filenames are all correct and a font file for each filename can be found in the proper drive and or path. See page 66 for more information. Your fonts must all have unique ID numbers or they load over each other.

APPENDIX C: THE FONT EDITOR

The Font Editor (**FONTEDIT.PRG** on your disk) is a special program which you use to create your own fonts - character sets of letters, numbers and punctuation. Or you can create map symbols, special graphics, international character sets, text or game images for your own use. It produces fonts that must then be converted into GEM fonts before they can be loaded into the DEGAS Elite program (the **ASSIGN.SYS** file must be amended to include their filenames as well).

Using the font editor is very simple; it works very much like the 'Make Fill' feature in DEGAS Elite. First, load the program by positioning the mouse cursor on the program icon when in GEM mode and double click the left mouse button. When it loads, you see an empty grid at the bottom left corner of the screen; this is a magnified image of a single character; each block in the grid represents one pixel in the selected character. Along the bottom is a real-size display of each character with their system font equivalents above.

You can change the 128 'normal' characters (the first half of the normal ASCII character set) in the Atari character set to anything you want. That's all of the standard letters, numbers and punctuation on the keyboard - upper - and lower-case. Letters pressed with the CONTROL key are along the top line. Letters pressed with the ALTERNATE key however won't show in DEGAS Elite; there is no alternate character set.

At the top of the screen you see several boxes — view, character and font — which hold all of the font editor features. You select a feature by positioning the cursor in the box and pressing the left mouse button. Several of these features may also be activated by function or keyboard presses.

User defined fonts have six sizes, listed below. Your user-defined fonts work exactly the same as the system font as far as text positioning and display goes.

LOADING A FONT

Keystroke: F8

The default font in DEGAS Elite is the ST's 'system font' which can't be edited. When you run **FONTEDIT.PRG**, you have a new, blank set of characters with no definitions. You can create a new font for your own use or you can load a font from disk and edit a part or all of it.

If you want to edit or change a font file on disk, select the load box in the font box or press the F8 function key. You'll see a directory of files with the .FNT extension. Select the file you want with the mouse cursor then click on the OKAY box to load it. You can then alter or edit that font. Selecting the erase box completely clears out the current font and gives you back a blank font to work with.

EDITING A FONT

Keystroke: F1 to F7

You can edit the characters shown at the bottom of the screen - the default blank or empty font or characters from a loaded font. A character set can be text, graphics, special symbols - almost anything you can imagine. You can use a character set to create terrain for a game, for international characters such as Greek or Russian, for mathematical symbols or more.

First, move the cursor over the character you want to edit and press the left mouse button. This loads that character into the grid at the lower left (16 pixels high by 8 wide). Now you can edit that character. Use the mouse to move the cursor and turn on or off the pixels in the grid exactly as you do in the fill pattern editor. The font pixels are simply on or off - black or white - color has no effect. You choose a font color from the palette in DEGAS Elite' menu screen.

The editing features are all shown in the character box. The **arrow keys** move a character one pixel in that direction (or use the keyboard arrow keys below the UNDO key). **Fill solid** (or the INSERT key) turns on all pixels in a character. **Erase** (or the CLR/HOME key) erases (turns off) all pixels. **Toggle** 'flips' pixels; switching on for off and vice versa. These work just like fill, erase and toggle options in the fill pattern editor in DEGAS Elite.

Vflip and Hflip flip a character vertically (top to bottom and vice versa) or horizontally (left to right), mirroring its shape along the chosen axis. Copy lets you copy one character to another. You'll be prompted to select the character you want to copy - move the cursor to it and press the left mouse button - and which character you want to copy it to - use the same process. The right mouse button cancels the copy if pressed before you press the left button. The UNDO key restores the character you're working with and cancels your changes to it.

The view box lets you see your font in the various heights and widths on a separate screen (you can also use the function keys to display the font). Each height will later be turned into a separate font file by the conversion program.

Font Size:	**Pixel Size**	**Function Key**
1 half height, normal width	8 by 8	F1 *
2 half height, double width	8 by 16	F2 *
3 normal height and width	16 by 8	F3
4 normal height, double width	16 by 16	F4
5 double height, normal width	32 by 8	F5
6 double height, double width	32 by 16	F6

To return to the editing screen, press either mouse button.

Half-height mode must be enabled first in order to make the first two sizes readable (the default mode). The half-height mode uses every other row of pixels in the character, starting at the top. To disable the half-height mode select the disable box (or press the F7 function key). The status of the half-height mode is displayed in the box at the top of the screen. Also, if disabled, the text sizes one and two will appear in half-intensity in the view box. In order to see the first and second sizes, the half-height mode must be enabled.

If your font won't be readable in half-height modes, disable the half-height feature by selecting the box or pressing F7. This means your font will only have four sizes. When you save a font, the half-height switch is saved with the file so DEGAS Elite knows whether or not the font can be displayed in that size. If disabled, the conversion program will not create a file for that font size (see below).

SAVING A FONT

Keystroke: F9

To save the font you've been working on to disk, select the save box in the font window (or press the F9 function key). You'll be given the directory window' you can select a font from the window with the mouse or type in a new file name. Saving and loading fonts work exactly like saving and loading pictures. You don't have to type the extension; DEGAS Elite does it automatically. The half-height switch (see above) is saved with the font.

Fonts are saved with their proper name, the name that appears on the list of fonts when you select one to use in DEGAS Elite. The files names do not have to be the same as the font names, although a similar name saves you from confusion later.

The fonts you create with this editor are all '16' point size. You might want to name their files with this information, such as '**COMPUT16.FNT**'. Other fonts can be loaded which have different sizes (see the ASSIGN.SYS section, below for more information).

ERASING A FONT

The erase box in the font window is used to completely clear a font, leaving you a blank character set to work with. You'll be asked to confirm this when you select it.

EXITING THE EDITOR

Keystroke: F10

Press the F10 key when you're ready to quit. This returns you to the desktop screen in GEM. You can then run DEGAS Elite and load your new font into the system by selecting the 'load font' box in the menu screen.

SYSTEM FONT

The default GEM font is called the 'system' font. It can be returned to in DEGAS Elite by selecting the '6x6 SYSTEM' as a font. You cannot edit this file with the font editor program. To restore a blank font to the editor, use the erase feature. Remember that when you change a font in DEGAS Elite, it doesn't change any text already entered on the screen, only the text which is about to be entered.

THE ASSIGN.SYS FILE

This file contains the list of font files which DEGAS Elite loads when booted. It must be in the root directory on drive A: when you load the program. The files can be in any directory or folder, as long as they are altogether and the drive/folder is specified in this file. To use the fonts properly, the file GDOS.PRG must be in a folder called AUTO on your boot disk.

The DEGAS Elite Font editor creates font files which, when converted to GEM fonts with FONTCONV.PRG, can be used by DEGAS Elite. Other font editors may also produce GEM Fonts which can be used by DEGAS Elite. You must make sure that the names of the font files you wish to load are listed in ASSIGN.SYS. There are several rules to obey when changing the ASSIGN.SYS file or creating a new one:

- You must put the names of all the font files you want to load, after the screen type description (screen.sys sections 01, 02, 03, 04, shown below) for low resolution, 03 is medium resolution, 04 is high resolution (monochrome). With this setup, you can setup your ASSIGN.SYS file so that you have specified fonts assigned to each resolution.

- The location of the font files must be specified by first specifying a path and folder on the first line.

- Comments may be included in the file if prefixed with a semicolon(;).

Here is the ASSIGN.SYS file that comes on your DEGAS Elite distribution disk:

```
path = a:\fonts\            ;Pathname containing fonts
;
01p screen.sys              ;Default screen
ATR10.FNT
ATR17.FNT
ATR18.FNT
ATR18.GNT
IBM10.FNT
IBM14.FNW
IBM18.FNT
IBM36.FNT
;
02p screen.sys              ;Low-resolution screen
COMPHS08.FNT
COMPSS16.FNT
COMPD32.FNT
```

```
COMPPHD08/FNT
COMPSD16.FNT
COMPDD32.FNT
;
03p screen.sys              ;Medium-resolution screen
COMPHS08.FNT
COMPSS16.FNW
COMPDS32.FNT
COMPHD08.FNT
COMPSG16.FNT
COMPDD32.FNT
;
04p screen.sys              ;High-resolution screen
COMPHS08.FNT
COMPSS16.FNT
COMPDS32.FNT
COMPHD08.FNT
COMPSD16.FNT
COMPDD32.FNT
;
21 fx80.sys
31 META.SYS
```

This file has several font files, all with the extension ".FNT". However, there is only one actual font being loaded: the computer font. This appears in the font list in DEGAS Elite under two names: computer and computer extended. Each file belongs to the same font, but each is a different point size (8, 16 or 32 points). All these font files were generated from the same DEGAS font, using FONTCONV.PRG, as explained below. The Font Editor only produces one size (16 point), however FONTCONV.PRG (see below) converts the one font into separate GEM font files, one for each of the available font sizes (see editing, above). The two letters after the name "COMP" describe the height and width of the font (HS is half height, single width, DD is double height and width, etc.).

When you examine the font list in DEGAS Elite, you see the font as two names: **computer** (for regular width, or 16 pionts) and **computer extended** for double width (32 point). You can delete any of these filenames from ASSIGN.SYS if you do not wish to use that particular font or size.

The other information in the ASSIGN.SYS file consists of the drive and pathnames where the fonts can be found, the screen drivers (the screen.sys files), the default printer driver (21 fx80.SYS) and the meta file driver (31 META.SYS). The file must end with a CONTROL-Z. Do

NOT change anything except the names of the fonts listed immediately after the first screen driver (in this case, the COMPXXXX files).

To add a font to this list, type in the name of the file(s) immediately after the existing font list. To delete a file or an entire font, delete the line(s) which have the filename(s) of that font. Each font filename must be on a single line and each line must end with a carriage return. Any font file not named on this list will NOT be loaded into DEGAS Elite when you boot the program next.

Note that you should use a text editor or word processor that creates an ASCII file only; PaperClip Elite, HabaWriter (in ASCII mode) TextPro and Final Word are examples of programs that do this. If you use other programs, such as ST Writer, you may have to 'print' the file to disk first (in ST Writer, set the left, top and bottom margins to zero first, and page length to twice the number of lines you're using, including the last Control-Z).

A final note: you *must reboot your disk* or system with GDOS in the auto folder to load any new fonts you added to ASSIGN.SYS or discard any deleted fonts. If you simply change the font names in the file, the changes will not take effect until the next time you boot the system. You cannot simply double click GDOS.PRG file; you must reboot.

CONVERTING YOUR FONTS TO GEM FONTS

The program **FONTCONV.PRG** takes a font editor file and translates it into several GEM font files, one for each height (if half-height is disabled, it will not be created). Each file should be listed in the **ASSIGN.SYS** file afterwards, to allow it to load into DEGAS Elite (see above). To run this program, double-click on the program icon and select the font file to convert from the GEM selector box. You can change drives by clicking on the drive/folder line, pressing ESC, entering your own drive/folder name and clicking on the grey bar.

When you pick the DEGAS font file to convert, FONTCONV.PRG displays a dialog where you enter the name of the font for both the normal width and double width (extended) fonts. These are assigned unique font identifier numbers. Write these numbers down; each font must have its own unique number. The default starts at 50. The first font you create will have an ID number of 50, and if you use the extended font, it will be numbered 51. The next field you convert *must be numbered differently.* Move the cursor to the field where the number is displayed and change either or both digits. Numbers can range from 01 to 99. We suggest you use number 50 or above to avoid conflict with other GEM fonts.

You can also enter a four-character font filename prefix or let the program use a default. Filenames will follow the convention used in the ASSIGN.SYS file above, with their sizes noted as part of the filename. The actual GEM font filenames appear on the screen as the font editor file is processed.

For example, the COMPUTER.FNT file defaults to COMP for the prefix, and will generate COMPHS08.FNT (half-height, single width, 8 points high), COMPSS16.FNT (single height, 16 points), COMPDS32.FNT (double height, single width, 32 points) as the first font file group — these are assigned the first font identifier number. The extended (double width) font is COMPHD08.FNT (half/double, 8 points), COMPSD16.FNT (single height, double width 16 points) and COMPDD16.FNT (double height and width, 32 points). You can click on the appropriate buttons in the dialog to output only the font sizes you want.

Each font takes up the memory required by the font files plus a bit of overhead. That's one reason to reduce the number of workscreens when you boot DEGAS Elite (hold down the ALT key when loading). Note that a 520 ST has only two workscreens maximum if GDOS is loaded) — each workscreen is 32,000 bytes in size! You could use a single font file for any font, but then when you go to change text sizes, DEGAS Elite has to use that single font to extrapolate all other sizes. Then — at especially large or small sizes — the font may become distorted and you'll have to use the magnify mode to improve its look. If you want to load several fonts but lack the available memory, then you should remove some of the larger font files (ig: the 32 point sizes) from the disk and let DEGAS build that size from smaller sizes. With a file for each text size, however, there is no distortion when changing sizes.

APPENDIX D: Showing Your Pictures

SHOWPIC2/PRG is an automatic picture display program which will cycle continuousoy through all of the DEGAS Elite pictures on a disk. Double click on the **SHOWPIC2.PRG** icon to run this program.

Showpic2 is intelligent; it knows the type of monitor you're using; it will only display high-res pictures or blocks on the monochrome screen and both low and medium (in the same show!) on the color monitor. It also knows where to find your picture files once you tell it the drive(s) where pictures are stored.

The initial screen lets you specify whether or not to display pictures (both compressed and non-compressed), blocks, or filenames. You can select one or all by clicking on the appropriate box. You can reselect these choices at any time by pressing the HELP key.

The second screen lets you select one or more drives where the pictures can be found. You don't have to specify a folder or pathname: Showpic2 searches the directories by itself and finds any DEGAS format files (PI1-3, PC1-3 or BL1-3) and displays them, wherever they are. A third screen gives you the option of continuing or quitting.

Showpic2 runs by itself, cycling endlessly through the available pictures for display. Each picture is shown for four seconds – the time it takes to load a picture – unless you change the time. To alter the viewing time, press the function keys:

Key	**Time**
F1	4 seconds
F2	8 seconds
F3	12 seconds
F4	16 seconds
F5	20 seconds
F6	24 seconds
F7	34 seconds
F8	44 seconds
F9	54 sgconds
F10	64 seconds

The space bar pauses a picture and holds it until pressed again. UNDO quits the program and puts you back in the GEM desktop. HELP starts the program again so you can reselect the parameters in the initial screens.

APPENDIX E:
File Formats And Compression

PICTURE FILES

Picture files used by DEGAS Elite can be in one of two formats: COMPRESSED or UNCOMPRESSED. Uncompressed files are saved with .PI1, .PI2 or .PI3 extenders, for low, medium or high resolution, respectively. Compressed files can be identified by their .PC1, .PC2 and .PC3 extenders.

The original DEGAS program saved its pictures in the uncompressed format, and is unable to load compressed files. For this reason, if you are saving a picture that will be sent to a user of the original DEGAS program, be sure to save it in UNCOMPRESSED format.

UNCOMPRESSED FILES:

1 WORD (2 bytes): Resolution flag

This is a WORD value that is either 0 (low resolution), 1 (medium resolution) or 2 (high resolution monochrome).

16 WORDS (32 bytes): Color palette

This is a table of 16 WORD values that make up the color palette for the image, in standard ST BIOS format.

32000 BYTES: Picture image data

This is a raw memory image of the picture as it is stored in the ST. All ST images are 32000 bytes in length, regardless of resolution.

The following part of the DEGAS picture file is optional; it is used to tell the computer the settings for color palette animation.

4 WORDS (8 bytes): Left animation limit table

This is a table of 4 WORD values which specify the left limits of each of the four color animation channels. The values range from 0-15, indicating that the corresponding color palette entry is the left range of the animation channel's range.

4 WORDS (8 bytes): Right animation limit table

This is a table of 4 WORD values which specify the right color palette limit for each of the four animation channels, ranging from 0-15. This table is used in conjunction with the left animation limit table to specify the range of the animation cycle. This value should be greater than or equal to the corresponding left animation limit value for proper operation.

4 WORDS (8 bytes): Animation channel direction flag

This is a table of four WORD values which specify the cycling direction for the corresponding animation channel. A value of 0 indicates that the channel shifts its colors to the LEFT, a value of 1 indicates that the channel is turned OFF, and a value of 2 indicates a RIGHT shift.

4 WORDS (8 bytes): Animation channel delay

This is a table of four WORD values which specify the speed at which the color registers in the animation channel range will be shifted. The range of permissible values in these variables is from 0-128, indicating the number of 60-hertz delay periods between color shifts. A value of zero in this table indicates the maximum speed, approximately 60 shifts per second; a value of 60 is approximately one shift per second; a value of 120 roughly one shift every two seconds.

COMPRESSED FILES

Compressed DEGAS picture files are similar to uncompressed files, but have two main differences.

The first difference is that the first two bytes in the file (the resolution flag) has the high-order bit set to indicate that the picture is compressed. That is, a value of $8000 means low-resolution compressed, $8001 means medium-resolution compressed, and $8002 means high-resolution (monochrome) compressed. Other bits in this flag may be used in the future, so do a simple bit test when checking for compression.

The color palette is not compressed, you can read it normally.

The second difference in a compressed file is that the image data is compressed using a special process, making it a variable length less than 32000 bytes. When reading this data, the program must check for the following byte values:

0....127: Copy the next n+1 bytes literally
-1..-127: Copy the next byte -n+1 times
-128: No operation (ignore)

The data is compressed so that each scan line is compressed separately, and each bit plane is also compressed separately. That is, the first data in the file will be the data for the low-order bit plane of scan line 0, followed by the data for the next bit plane of scan line 0, and so on, with the low-order bit-plane of scan line 1 next. This process repeats until all bit planes of all scan lines are processed.

The color animation data is stored in an uncompressed form and is read normally, if present.

BLOCK IMAGE FILES

The block image files used by DEGAS Elite is a subset of the Electronic Arts Interchange File Format (IFF). This file format is used by the Amiga personal computer, and by using this format, Atari and Amiga users can easily exchange clipped images and whole pictures, if desired. The file format is described in the Commodore-Amiga document "EA IFF 85 Standard for Interchange Format Files", which is available through Commodore-Amiga. The IFF concept is more than just a picture storage standard, but encompasses many types of files.

If you are interested in reading the IFF block files in your own programs, issue #2 of START Magazine, The ST Quarterly (published by Antic Publishing, 524 Second Street, San Francisco, CA 94107) has an article and program source code which describes the reading of IFF files.

The DEGAS Elite block files can be identified by the .BL1 (low resolution), .BL2 (medium resolution) and .BL3 (high resolution monochrome) extenders on the files. These files are only loadable into the corresponding resolution, and can store from one pixel to an entire screen.

ICON FILES

If you are a programmer, DEGAS Elite has a handy ability to save block images in an ICON file format. These files are readable by the Digital Research Resource Construction Set program, and allow you to use DEGAS Elite as an advanced icon or bit-image editor.

Icons and bit-images are loadable into any resolution (because they are single-plane images that do not carry color information with them), and have the side-benefit of being a readable file. In fact, they are designed to be included in your C source code and compiled directly into your programs!

The file format looks like this:

```
/* DEGAS Elite Icon Definition */
#define ICON_W 0x0009
#define ICON_H 0x0008
#define ICONSIZE 0x0008
int image[ICONSIZE] = { 0xC180, 0xE180, 0xF180, 0xD980, 0xCD80,
0xC780, 0xC380, 0xC180 };
```

This is an icon file for a bit image of an "N" shape. It is 9 pixels wide (line 2), 8 pixels high (line 3), and takes 8 words to define the shape (line 4). Lines 6 and 7 are the icon data, stored in hexadecimal format. Note that any hex data lines with commas at the end (indicating there is more data to follow in subsequent lines) must have a space character (32 decimal) following the comma, even though you cannot see it. This is due to a quirk in the Resource Construction set program. Each line is terminated with a CR/LF combination.

FILL FILES

DEGAS Elite has two types of fill patterns: Monoplane and multiplane fills. The monochrome mode can only use monoplane fills because it only has one bit plane. The ST's color modes can have full-color fill patterns, which are defined with more than one bit plane. Monoplane fill patterns can be used in all resolutions.

Monoplane Fill Pattern Files

These files, stored with .FIL extenders, are simply 16 LONGS (32 bytes) of data. Each fill pattern is 16 by 16 pixels, and is defined by the low words of the16 LONGS, each one making up one horizontal line of pixels in the pattern. The first low-order WORD is the first line in the pattern, the second low-order WORD is the second line in the pattern, and so forth. Each ON bit corresponds to an ON pixel in the pattern.

Low-resolution Fill Files

These files, stored with .FI1 extenders, are a little more complex than the monoplane fill pattern files. The first 16 WORDS (32 bytes) in the file is the ST color palette data that was used to create the fill pattern. This becomes important when matching different color palettes to approximate the colors that were originally used. See the section on remapping color fill patterns in the DEGAS Elite manual.

The remaining 128 bytes in the file are two sets of 16 WORDS which make up the four bit planes for the fill pattern. To get all 16 colors to work in the fill pattern, we must have four bit planes. The bit planes are identical to those of the monoplane fill pattern, but are stored with the low-order plane first (i.e. plane 0-1-2-3, bits 1-2-4-8).

To use the bit plane data, simply read it into memory and use the vsf_udpat() function to set up the user-defined fill pattern. Be sure to specify that the pattern uses four bit planes.

Medium-resolution Fill Files

These files are similar to the low-resolution fill files, but use an extender of .FI2 to indicate that it is for medium resolution. Like the low-res fill pattern files, the first 32 bytes in this file are the color palette for the fill pattern. The remainder of the file is the 64 bytes of data which makes up the two bit planes for the pattern (16 WORDS X 2 planes). These planes are also stored low-order plane first.

Use the vsf_udpat() function to set the pattern as the user-defined selection, using a value of 2 for the bit plane parameter.

BRUSH FILES

DEGAS Elite uses a simple format to store brush files (using the extender .BRU). This file format is identical to that used by the original DEGAS, so all files are interchangeable.

Each brush file is an 8 X 8 pixel square, for 64 pixels total. The brush file is simply a 64-byte block of data, one byte for each pixel in the brush. A byte value of zero means there is no pixel in the location, a byte value of 1 indicates that the pixel is on. The upper-left pixel in the brush is the first byte in the file, the next pixel to the right is the second, and so on. The lower-right pixel in the brush is the 64th byte.

FONT FILES

In order to provide better fonts with higher resolution and proportional spacing, DEGAS Elite does not load fonts itself, but delegates this task to the GEM Graphics Device Operating System (GDOS). GDOS loads font files that are stored in the GEM font file format, described in the GEM VDI manual. The original DEGAS program's fonts may be converted to GEM font format using a utility program found on CompuServe's Atari Special Interest Group for the ST, ATARI16.

PRINTER DRIVERS

If you are an experienced machine language programmer, you may wish to write a custom printer or plotter driver, for monochrome or black and white printers, using either the Centronics (R) printer port or the RS-232 port.

The printer driver must itself be position-independent, executable 68000 machine language code. It must be exactly 2000 bytes long (if it's shorter, pad to the end of the file with zeroes).

DEGAS Elite provides five pieces of information for the printer driver to be able to carry out its function:

1) The printer driver command
2) The screen resolution
3) The base address of the current screen
4) The address of the color palette information
5) The address of a 1280-byte work area.

Printer Driver Command

This is a WORD value which may contain two different values - one or zero - which indicate the function the driver is to perform.

If the value is zero, the printer driver is to set up the data values it needs, then initialize the printer or plotter. If the initialization was successful, the driver should return the number '1' in register D0.W. If unsuccessful, the driver should return a '0' in D0.W. No other values should be returned. The initialization will always be executed before the dump function.

If the command value is one, the driver is to perform the screen dump function. The driver must examine the screen RAM, extract the pixel information, convert it into a format that the printer or plotter can use, then send it to the device via one of the ports. The driver should perform a status operation before each byte is sent to the printer to be sure it is ready to receive the data. If the device isn't ready after a reasonable timeout, the driver should return a value of '0' in D0.W to indicate an error has occurred.

During the screen dump operation, the driver should check the keyboard periodically to see if the user has pressed the UNDO key to abort the dump operation. Stop all output and return a value of '2' in D0.W.

If the screen dump terminates normally, return with D0.W equal to a value of '1'.

Screen Resolution Indicator

This is a WORD value which indicates the resolution of the picture to be dumped:

Zero means 320 by 200, 16 color picture
One means 640 by 200, 4 color picture
Two means a 640 by 400, monochrome picture

Screen Base Address Pointer

This LONG vale is the starting address of the memory used to store the current screen picture information. The block of memory is always 32,000 bytes long. All pixel addresses must be calculated from this address.

Color Palette Pointer

This LONG value is the starting address of the color palette information. The palette consists of sixteen word values which contain the Red, Green and Blue color settings for each color register.

Work Area Address

This LONG value is the start of a 1,280 byte work area reserved for the printer driver's use. Since the driver must operate at any point in the system's memory, this address provides a safe, convenient area of memory to store tables, pixel information, data buffers, etc.

Other Information

The printer driver is called with the C language statement:

```
PRINT(COMMAND,REZ,SCREEN,PALETTE,WORKAREA)
```

Upon entry into the driver, the variables may be found at the following locations relative to the stack pointer (A7):

COMMAND	4(A7)
REZ	6(A7)
SCREEN	8(A7)
PALETTE	12(A7)
WORKAREA	16(A7)

The printer driver should save all registers except D0 upon entry and restore their contents before returning.

Commented examples of 68000 printer drivers source code may be found in the Data Library of the Atari 16 Bit Special Interest Group (SIG) on the CompuServe Information Service.

DEGAS ELITE REFERENCE GUIDE

MOUSE BUTTONS:

Right: toggle between selected work (drawing) screen & menu screen.

Left: select menu item.
double click: enter set item dialog. Start draw, fill, circle, etc. feature.
second click: set geometric form when defined.

ALT+Left button: start block distort function after corners have been moved. Enter magnification mode after function key is pressed to select.

KEYS:

ESC: select crosshairs for block definition; clears current block buffer once you start to redefine a new block. Also used to clear a GEM item selector line or the current screen name line. If block is grabbed, automatically toggles block mode.

SHIFT+ESC: sets block mode to polygon block rather than rectangular block.

RETURN: set (establish) block at current location.
connect last point drawn in polygon with first point.

UNDO: stop block rotation, skew, distort, undo last draw, return picture to previous state, erase last block set, terminate screen dump to printer.

HELP: allows you to see the names of your workscreens, enter new names or change existing names.

Arrow keys:

Block defined and block mode selected: flip block in indicated direction.

Draw mode: up/down cycle through color choices, one color right (up) or left (down) at a time, right/left cycle through brush choices in that direction, one at a time. Toggles draw mode.

Magnify mode: move area under magnification in that direction.

FUNCTION keys: enter magnification mode
F1: 3 times magnification
F2: 4 times
F3: 5 times
F4: 6 times
F5: 7 times
F6: 8 times
F7: 9 times
F8: 10 times
F9: 11 times
F10: 12 times.
Use the left mouse button to enter the magnified drawing screen.

ALT: when selecting/defining a block area, this toggles Move block instead of copy. When held down while defining a circle, it insures the circle is 'perfect' rather than an ellipse when drawn. When held down while defining a box, it creates rounded corners, rather than square corners.

ALT: when changing or defining colors in menu screen, if you click on a color to change, then position the cursor over another color, hold the ALT key, then press the left mouse button, DEGAS Elite will make all colors between those two an intermediate shade between them. Alt is also required with the left mouse button to implement the distort feature.

ALT: if held down in block stretch, only permits vertical stretching.

ALT: If held down while loading the program, it allows you to select how many workscreens to assign. If not held down, the maximum available is assigned, given the memory configuration and desk accessories. Fewer screens allow more fonts to be loaded.

ALT: If held down while clicking on a box in the main menu screen, it opens the feature's dialog box instead.

ALT+ARROWS: moves cursor one 'unit' in direction of arrow key.

ALT+SHIFT+ARROWS: moves cursor one pixel in direction of arrow key.

BACKSPACE and DELETE: in text mode, these erase the letters to the left and right of the cursor, respectively. Also used to edit the screen names.

CONTROL: when filling an area, holding Control before pressing the left mouse button fills the area with a solid, rather than a pattern. Also, when drawing a box, polygon or a disc, Control fills the shape with a solid rather than a pattern.

CONTROL: when held down in block stretch, it preserves the shape and 'scales' the block.

SHIFT: When held down while defining a disc, box or polygon in pattern mode, it adds an outline of the selected color to the shape. May also be used with Control and Alt keys.

SHIFT: when held down in block stretch, it only permits horizontal stretching.

NUMBERS: 1 to 8 - jump to the workscreen of that number, if available.

NUMBER 0: return to main menu screen

TAB: toggle animation on/off (first the color group must be set in the main menu screen).

+/-: in magnify mode, move magnification level up or down one, respectively.

KEYBOARD COMMAND CHOICES:

(remember that many of these toggle other modifiers)

A: select airbrush
B: toggle block or brush mode
C: select circle
D: select draw
E: select eraser
F: select frame
G: select polygon
H: select shadow
I: select disk
J: not used
K: select K-line
L: select line
M: select mirror
N: toggle snap on/off
O: select outline
P: select point
Q: not used
R: select rays
S: select stipple
T: select text
U: not used
V: not used
W: select slowdraw
X: select box
Y: not used
Z: select fill

Control+Key
Control+C: toggle change mode
Control+I: toggle animation
Control+M: select smear mode
Control+N: select normal mode
Control+P: select pattern mode
Control+S: select solid mode
Control+Y: select color cycle mode
Control+ESC: enter selected drawing screen

Feature:	**Mode:**	**Works with:**
Brush	solid or pattern	eraser, draw, point, stipple, line, k-line, polygon, rays, circle, frame slowdraw, snap, cycle, smear, change
Block	solid only	eraser, draw, point, stipple, line, k-line, rays,circle, frame, slowdraw, snap
Cycle*	solid	stipple, line, k-line, rays, circle, frame, outline, airbrush, mirror, snap, slowdraw, draw, point, polygon, disc, box
	pattern	draw, point, stipple, line, k-line, polygon, rays, circle, disc, frame, box, airbrush, mirror, shadow, slowdraw, snap
Change*	solid or pattern	draw, point, stipple, line, k-line, circle, frame, airbrush, mirror, shadow, slowdraw, snap
Smear	solid or pattern	draw, point, stipple, line, k-line, circle, frame, airbrush, mirror, shadow, slowdraw, snap

* Cycle, change, animation and color fills do not function in monochrome.

Solid and pattern have two different meanings. With drawing features such as lines, circles and stipple, solid means solid color and pattern means the pattern showing in the pattern box. With mono fills and such objects as disc and box, however, solid means that the fill overpaints everything below it and pattern means that the pattern below shows through.

DEGAS ELITE FILENAME EXTENDERS

.PI1: low resolution picture
.PC1: compressed low resolution picture
.PI2: medium resolution picture
.PC2: compressed medium resolution picture
.PI3: high resolution picture
.PC3: compressed high resolution picture
.BL1: low resolution block
.BL2: medium resolution block
.BL3: high resolution block
.BRU: brush shape file
.FIL: mono fill pattern file
.FI1: color fill pattern, low-res
.FI2: color fill pattern, med-res
.ICN: icon file
.PRT: printer driver file
.PIC: Koala pad (8-bit) picture
.IFF: IFF (Amiga) format picture
.NEO: Neochrome format picture

Note: ALT is the same as the ALTERNATE key

TOM HUDSON: BIOGRAPHY OF THE PROGRAM AUTHOR

Tom Hudson is a free-lance software developer who works primarily with the Atari ST series of microcomputers. He started working with computers in 1976 while attending high school, working with an antiquated IBM 1620 punch-card operated system. After high school, he earned an Associate of Science degree in data processing. During this period, he worked as a tutor, teaching non-technical people how to program microcomputers.

From 1978-1982, he worked as a programmer/operator at a savings and loan association and earned a Bachelor of Science degree in data processing from Southwest Missouri State University.

From 1982-1985, he acted as head of programming at ANALOG Computing magazine, where he wrote programming columns and many types of programs, handled photography for the magazine, and created the ANALOG Computing Telecommunications System, a multi-user BBS.

After leaving ANALOG in the summer of 1985, he wrote DEGAS, a paint program, for Batteries Included. In Spring 1986, he wrote CAD-3D, an advanced solid-modeling system for the ST. DEGAS Elite is his third commercial product for the ST series.

Tom is currently a System Operator in the Atari Special Interest Group (SIG) on the CompuServe telecommunications service. He can be reached on the Atari SIG (ATARI16 or ATARIDEV), his user ID is 76703,4224.

Tom's interests include computer graphics, photography, model building, electronics, astronomy, electronic music, cartooning, cartoon animation, racquetball, creative writing, scuba diving and many other areas.

He currently resides in Mission, Kansas.

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